Superfund Records Center SITE: Findustic Plex BREAK: 3,2
OTHER: 35250

Figures



Figure 2.0 Sediment sampling in HBHA Pond.



Figure 2.1 HBHA Pond 3.



Figure 2.2 Preparing to sample at Station SD-01. Aberjona River Upstream of Site.

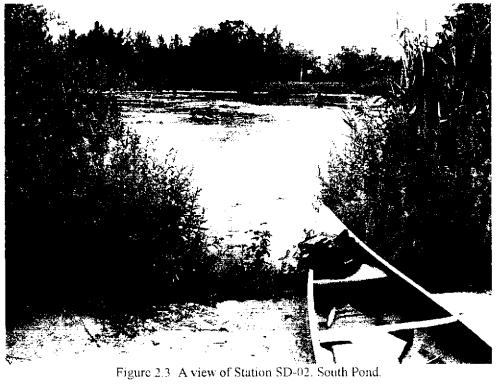




Figure 2.4 Station SD-03, Phillips Pond

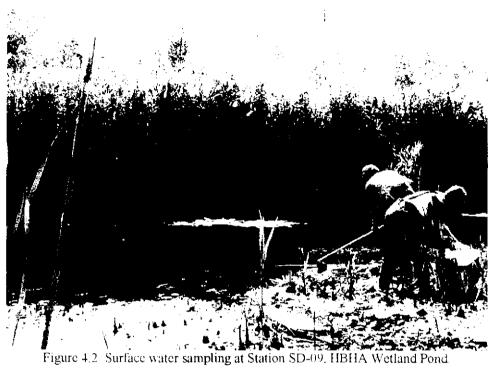




Figure 5.0 Filling sample container for sediment VOC analysis.

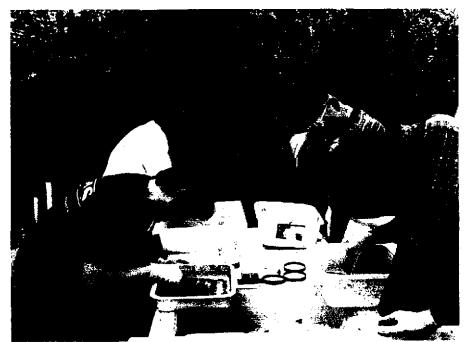


Figure 8.0 Sampling benthic invertebrates for tissue analysis.



Figure 9.0 Largemouth Bass from HBHA



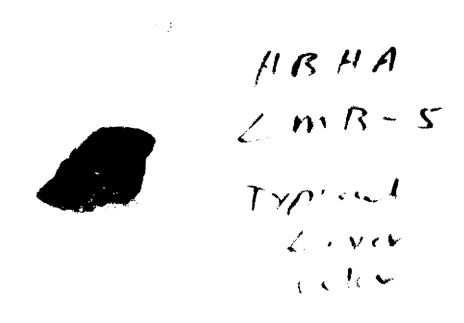


Figure 9.2 Normal largemouth bass liver, taken from HBHA.

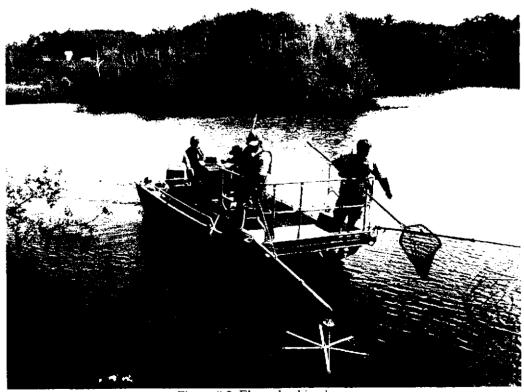


Figure 9.3 Electoshocking boat.



Figure 10.0 Stand of water tilies in HBHA Wetland Pond.

Appendix A Habitat Evaluation Forms

Low Gradient Stream Habitat Assessment Scores For Industriplex, Woburn, Massachusetts

Station:	SD-01	SD-02	SD-03	SD-04	SD-05	SD-06	SD-07	SD-08	SD-09	SD-10	SD-11	SD-12	SD-13
Epifaunal Substrate/ Available Cover	4	17	14	16	5	5	5	11	13	7	10	13	11
2. Pool Substrate Characterization	10	15	11	12	6	6	6	14	13	10	9	10	7
3. Pool Variability	4	NA	NA	6	NA	NA	NA	NA	5	NA	NA	5	12
4. Sediment Deposition	4	3	10	19	5	5	5	11	5	6	4	19	9
5. Channel Flow Status	3	18	17	9	17	17	17	16	7	8	13	16	6
6. Channel Alteration	20	13	13	14	3	3	3	16	18	17	9	14	7
7. Channel Sinuosity	10	5	4	14	2	2	2	4	8	3	7	17	13
8. Bank Stability (Left Bank)	9	9	9	9	7	7	7	9	9	9	9	8	9
Bank Stability (Right Bank)	9	9	9	9	7	7	7	9	9	9	9	-8	9
9. Vegetative Protection (Left Bank)	10	6	7	10	6	6	6	6	7	7	7	9	8
Vegetative Protection (Right Bank)	10	6	7	10	6	6	6	6	7	7	7	9	8
10. Riparian Vegetative Zone Width (Left Bank)	10	5	3	10	2	2	2	5	8	8	3	10	8
Riparian Vegetative Zone Width (Right Bank)	10	5	3	10	2_	2	2	5	8	8	3	10	8
TOTAL SCORE	113	111	107	148	68	68	68	112	117	99	90	148	115

STREAM NAME S. by much Abunta	LOCATION N. Reading
STATION # 5001 RIVERMILE ()	STREAM CLASS
LATLONG	RIVER BASIN
STORET#	AGENCY
INVESTIGATORS	
FORM COMPLETED BY	DATE AH PH REASON FOR SURVEY

)	27.3.4.4	T	An This		<u>•</u>
na,	Habitat Parameter		, ~ ~ 	n Category	
ייץ.		Optimal	Suboptimal	Marginal	Poor
*	I. Epifamal Substrate/ Available Cover	Greater than 30% of substrate favorable for epifamal colonization and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat, well-suited for full colonization potential; adequate habitat for maintenance of populations; passence of additional substrate in the form of newfall, but not yet papared for colonization (may rate at high and of scale).	10-30% max of stable habitat; habitat availability less than desirable; substrate fraquently disturbed or removed.	Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.
ξy.	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 1 3 2 1 0
Parameters to be evaluated in sampling reach	2. Pool Substrate Characterization	Mixtue of substrate materials, with gravel and firms and mevalent, root mats and submerged vegetation common.	Mixtue of soft sand, mud, or clay; mud may be dominant; some mot mats and submerged regetation passent.	All mnd orclay orsand bottom; little or no root mat, no submerged vegetation.	Hard-panclay or bedrock; no not mat or vegetation.
10	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7) 6	5 4 3 2 1 0
be evalua	3. Poul Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
5	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameter	4 Sediment Deposition	Little or no enlargement of is lands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment, 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 7 2 1 0
	5. Charmel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Waterfills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or rifle substrates are mostly exposed.	Very little water in charmel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 (3) 2 1 0

Γ	Habitat	Political Control	Continu	n Caregory	
	Parameier	Optimal	Suboptimal	Marginal	Poor
	6. Charmel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	Banks shoud with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or
	20		past 20 yr) may be present, but recent channelization is not present.	disrupted.	removed entirely.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 7 3 2 1 0
ling reach	7. Channel Simusity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
1 2	SCORE	20 19 18 17 16	15 (14) 13 12 11	(10) 9 8 7 6	5 4 3 2 1 0
to be evaluated broader than rampling reach	2. Bank 5 ability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future publisms. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly lealed over. S-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "zaw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
1 2	SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 l 0
1	SCORE 4 (RB)	Right Bark (1) 9	8 7 6	5 4 3	2 1 0
Parameters to	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	aimort all plants allowed to grow raturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any greatestent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bar soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 30% of the steambank surfaces covered by vegetation; disruption of streambank vegetation has been removed to 5 certimeters or less in average stubble height.
	SCORE (CLB)	Left Bank 10	8 7 6	5 4 3	2 1 0
	SCORE (0 (RB)	Right Bank (10)	8 7 6	5 4 3	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 neters; luman activities (i.e., parking lots, madbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities
'	SCORE (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
	SCORE ((RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0

STREAM NAME South Branch of Aberpone	LOCATION W. Gurn		
STATION # SD-/ RIVERMILE	STREAM CLASS		
LATLONG	RIVER BASIN		
STORET#	AGENCY		
INVESTIGATORS			
FORM COMPLETED BY Ban Hoskins	DATE AM PM	REASON FOR SURVEY	

	Habitat Parameter		Condicion	n Category	
	- Tarmes	Optinel	Suboptimal	Marginal.	Poor
	L Epifamal Substrate/ Available Cover	Greater than 90% of substrate favorable for epifamal colomization and fish cover, mix of snags, sundercut banks, cobble or other stable habitat and at stage to allow full colomization potential (i.e., logs/snags that are not new fall and cost tramient).	30-50% mix of stable habitat, well-suited for full colonization potential; adequate habitat for manuscance of populations; passence of additional substance in the form of newfall, but not yet paspared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; nubstrate frequently disturbed or removed.	Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.
1 1	SCORE 76	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	Z Pool Substrate Characterization	Mixtue of substate materials, with gravel and firms and prevalent; root mate and sub merged vegetation common.	Mixtus of soft sand, mid, or clay, and may be dominant, some not mait and submerged regetation present.	All mind or clay or sand bottom, little or no root mat, no submerged vegetation.	Hard-panciay or bedrock; no not mat or vegetation
	SCORE 15	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0
	1 Pool Veriebility	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large- deep; very few shallow.		Majority of pools small- shallow or pools absent
45	SCORE 4	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 6 3 2 1 0
Parsmeter	4 Sediment Deposition	of is lands or point bars and less than 5% <20% for low-gradient steams) of the bottom affected by sediment deposition.	S-30% (2D-50% for low- gradient) of the bottom affected; slight deposition in pools.	new gravel, sand or fine sediment on old and new bars; 30-30% (50-80% for low-gradiers) of the bottom affected; sediment deposits at obstructions.	Heavy deposits of fine material, irre-ased bar development; most than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 🖏	5 4 3 2 1 0
	5 Charatel Flow	both lower banks, and minimal amount of	available channel; or <25% of channel	available channel, and/or of	Very little water in tharmel and mostly ones ent as standing tools.
	SCORE X	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	D4 (D2 1 0

_				<u>.</u>	
- 1	Habitat Parameier		Conditie	эл Сахеджу	
	FRIGHER	Optimal	Subortimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embanionents or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	80% of the stream reach
	score 20	20 19 18 17 1e	5 15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	7. Charmel Simuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight time. (Note channel braiding is considered mornal in coastal plants and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Charmel straight; waterway has been charmelized for a long distance.
	SCORE Y	20 19 18 17 16	15 14 13 12 11	10 9 3 7 6	5 4 3 2 1 0
Pargnetis to be evaluated broader de-	2. Bank Subility (scure each bank)	Banks stable; evidence of erosion or oank fainte absent or minimal; little potential for future published. <1% or oank affected.	Moderately stable; inflequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unrable; many erode area; "aw" areas frequent along straight sections and bends; obvious bank slongwing, 60-100% of bank has erosional scars.
1	SCORE (LE)	Left Bank 10 🚱	8 7 6	5 4 3	2 1 0
	SCORE 9 (RB)	Right 3ank 10 8	8 7 6 -	5 4 3	2 1 0
Parameters to	left or right side by firms downstream.	More than 50% of the streambank surfaces and immediate inparian induces covered by native vegetation, including trees, uniers only simulas, or nonwoody macophytes; vegetative disruption through gracing or mowing minimal or not evident, almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent, more than one-half of the potential plant stubble leight remaining.	50-70% of the steambank surfaces covered by regetation; disruption obvious; patrines of base soil or closely cropped regetation common; less than one-half of the potential plant stubble height remaining.	Less than 30% of the smeambank summers covered by vegetation; disruption of streambank vegetation has been removed in 5 central properties in average stubble neight.
1	1	Left Bank 10	® 7 6	5 4 3	2 1 0
	SCORE (RB)	Right Bank 10	Ø 7 6	5 4 3	2 1 0
	10. Riparian Vegenative Zone Width (score each back program zone)	Width of riparian zone >18 netwo; human activities (i.e., pasking lots, roadbeds, clear-cuts, lawns, or crops) have not unpaced zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian mre <6 merers: little or m riparian vegetation due to imman activities.
	~ ~ ~ ~ ~ / / /	Left Bank 10 🔗]	8 7 6	5 4 3	2 1 0
	SCORE (RB)	Right Bank 10 🕭	8 7 6	5 4 3	2 1 0

STREAM HAME South Pomp	LOCATION
STATION # SD - 2 RIVERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET#	AGENCY
INVESTIGATORS CAM	
FORM COMPLETED BY	DATE REASON FOR SURVEY

	Habitat Parameer	Condition Category					
	Parameer	Op timal	Suboptimal	Marginal	Poor		
	1. Epifamal Substrate/ Available Cover	Greater than 30% of substrate favorable for epifamial colorination and fish cover, mix of snags, momenged logs, undercut banks, cobble or other stable habitat and at stage to allow full colorination potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat, well-suited for full colormation poternial, adequate habitat for maintenance of populations; passence of additional substrate in the form of newfall, but not yet papared for colormation (may rate at high end of scale).	10-30% mix of stable habitat, habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.		
- F	SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0		
Parameters to be evaluated in sampling reach	Z Poel Substrate Correctivitation	Mirtue of substrate materials, with gravel and firms and prevalent, not mate and sub merged vegetation common.	Mixtus of soft sand, mud, or clay; and may be dominant, some mot main and submerged regetation present.	All mid or clay or sand bother; little or no not mat, no submerged vegetation.	Hard-panciay or bedrock; no not mat or vegetation		
13	SCORE	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0		
be evalua	1 Pool Veriability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large- deep; very few shallow.	Shallow pools much muse psevalent than deep pools.	Majority of pools small- shallow or pools absent		
5	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0		
Paramet		of is lands or point bars and less than 5% <20% for low-gradient steams) of the bottom affected by sediment deposition.	gradient) of the bottom affected; slight deposition in pook.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-30% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constructions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bur development; more than 50% (80% for low-gradient) of the bottom changing frequently, pools almost absent due to substantial sediment deposition.		
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 (3) 2 1 0		
	5. Chartrel Flow Startes	both lower banks, and minimal amount of	available channel; or <25% of channel		Very little water in channel and mostly piesent as standing pools.		
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0		

	Habitat	T	Conditi	on Category	
	Parameier	Optimal	Subortimal	Marrinel	Poor
	6. Charmel Alteration	Channelization or dredging absent or minimal, streamwith normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) maybe present, but recent channelization is not present.	Channelization may be extensive; embandments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	80% of the stream reach charmelized and
	SCORE	20 19 (18) 17 16	15 14 (13)12 11	10 9 8 7 6	5 4 3 2 1 0
pling reach	7. Charriel Simus sity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight lime. (Note charmed braiding is considered mornal in coastal plans and other low-lying areas. This parameter is not easily raised in these areas.	The bends in the stream increase the stream length 2 to 3 times in a straight lime.	The bends in the stream increase the stream length 2 to I times longer than if it was in a straight line.	Charmel straight; waterway has been charmelized for a long distance.
E 84	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
he crahated broader than rangling reach	8. Bank Subility (sewe such Sank)	Baric stable; evidence of erosion or bark failure absent or minimal; little potential for future publishes. <5% or bank affected.	Moderately stable; inflequent, small areas of erosion mostly healed over. S-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% or bank in reach has areas of erosion; high erosion potential during floods.	
1 4	SCORE (L3)	Left Bank 10 (9)	8 7 6	5 4 3	2 1 0
	SCORE(RB)	Right 3 ank 10 (9)	876-	5 4 3	2 1 0
Parsoneters to	9. Vegenative Protection (score each bank) Note: determine left or mont side by	rees, understory simules, or nonwoody macupinyes; vegetative disruption though graing or mowing minimal or not evident; almost all plants allowed	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well, represented; disruption evident but not affecting full plant growth potential to any great extent, more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 90% of the streambank surfaces covered by vegetamm; disruption of streambank vegetamon has been removed to 5 comments or less in average stubole neight.
	(E1) (L3)	Left Bank 10	8 7 6	(3) 4 3	2 1 0
	SCORE(RB)	Right Bank 10	8 7 6	(5) 4 3	2 1 0
	10. Ripariza Vegenative Zone Width (scorreach bank operium some)	>18 meters; human activities (i.e., pasking	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian mre <6 meiers: little or m riparian vegetarium due b imman activities.
	SCORE (LB)	Left Bank 10 9	8 7 6	3 4 3	2 1 0
	SCORE(RB)	Right Bank 10 9	8 7 6	S 4 3	2 1 0

STREAM NAME 5. Pond	LOCATION I Plak Woburn
STATION # 500 281 VERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET#	AGENCY
INVESTIGATORS	
FORM COMPLETED BY KO	DATE AM PM REASON FOR SURVEY

	Habitet Parameter	, 4			
1	Larenteer	Optimal	Suboptimal	Marginal	Poor
	l. Epifiamal Substrate/ Available Cover	Greater than 90% of substrate favorable for epifamal colonization and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.
1	SCORE	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	2 Poal Substrate Characterization	Mixtum of substrate materials, with gravel and firms and prevalent; root mats and sub merged vegetation common.	Mixtum of soft sand, mud, or clay; mud may be dominant, some mot mais and sub merged vegetation passent.	All mid or clay or said bothers; little or no root mat, no submarged vegetation.	Hard-pan clay or bedrock; no not mat or vegetation.
3	SCORE	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
be evalua	3. Poul Variability W/P	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present.	Majority of pools large- deep; very few-shallow.	Shallow pools much more purvalent than deep pools.	Majority of pools small- shallow or pools absent
5	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Paramet	4 Sediment Deposition /	and less than 5% < 20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-30% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently, pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 (6)
	5. Charmel Flow Status	both lower banks, and minimal amount of	Waterfills >75% of the available channel; or <25% of channel substrate is exposed.	Waterfills 25-75% of the available channel, and/or nifile substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 6 12 1/1

г			* ****		
1	Habitat Parameter		Conditio	n Category.	
		Optimal	Subspined	Morginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; streamwith normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging (greater than past 20 yr) may be present, but necent channelization is not present.	Channelization may be extensive; embandments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks showd with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	5CORE	20 19 18 17 16	15 14 13 12 (1)	10 9 8 7 6	5 4 3 2 1 0
oling reach	7. Chemnel Simuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
1	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 (2) 1 0
to be evaluated broader than sampling reach	2. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future publisms. <5% of bank affected.	Moderably stable; inflequent, small areas of exosion mostly healed over. 5-30% of bank in reach has areas of exosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded area; "now" areas frequent along straight sections and bends; obvious bank slonghing; 60-100% of bank has erosional scars.
1	SCORE(LB)	Left Bank 10 (9)	8 7 6	5 4 3	2 I 0
	SCORE(RB)	Right Bank 10	8 7 6 -	5 4 3	2 1 0
Parameters to	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody mucrophytes; vegetative disruption thangh grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by rative vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent, more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation, disruption obvious; patches of base soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation has been removed to 5 certimeters or less in average stubble height.
	SCORE(LB)	Left Bank 10	8 🚯 6	5 4 3	2 1 0
	SCORE(RB)	Right Bank 10	8 7 6	5 4 3	2 1 0
	18. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 neters; human activities (i.e., packing lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no ripanian vegetation due to human activities.
ł	SCORE(LB)	Left Bank 10 9	8 7 6	S 4 3	2 l 0
	SCORE(RB)	Right Bank 10 9	8 7 6	5 (4) 3	2 1 0

STREAM NAME SOUTH PONT	LOCATION
STATION # SQ-2 RIVERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET#	AGENCY
INVESTIGATORS	
FORM COMPLETED BY Bart Huskins	DATE 6-21-11 REASON FOR SURVEY

	Habitat Parameter		Conditio	и Самериту	
	Larancer	Optîmal	Suboptimal	Marginal	Poor
	l. Epifamal Substrain Available Cover	Greater than 30% of substrate favorable for epifamial colorization and fish cover, mix of snags, momerged logs, undernut banks, cobble or other stable habitat and at stage in allow full colorization possibility (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat well-suited for full colormation potential; adequate habitat for mammanance of populations; pursuase in the form of newfall, but not yet prepared for colormation (may rate at high end of scale).	10-30% mix of stable habitat, habitat habitat habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.
15	SCORE /	20 19 18 (7) 16	15 14 13 12	10 9 8 7 6	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	2 Pool Substrate Caracterization	Mixture of substate materials, with gravel and firms and prevalent, root mate and sub-marged vegetation common.	Minime of soft sand, med, or clay, and may be dominant, some mot man and submerged regetation pastent.	All mad or clay or sand bottom, little or no mot mat, no submarged registation.	Hard-panciay or bedruck; no mot mat or vegetation.
12	SCORE 15	20 19 18 17 (6)	I5 14 I3 I2 II	10 9 8 0 6	5 4 3 2 1 0
be evalua	3 Pool Variability NA	Even mix of large- snallow, large-deep, small-snallow, small- deep pools present	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
F S	SCORE	20 19 18 17	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Paramet	4 Sediment Deposition	of is lands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment, 5-30% (20-30% for low-gratient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, immessed bar development; more than 50% (80% for low-gradient) of the bottom changing frequently, pools almost absent due to substantial sediment deposition.
	SCORE 3	20 19 18 17 16	15 14 13 12 11	10 8 7 6	5 4 3 2 1 0
	5. Channel Flow Sixtus	both lowerbanks, and minimal amount of	<25% of channel	available channel, and/or rifle substrates are	Very little water in charmel and mostly present as standing pools.
	SCORE 18	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

	Habitat Parameier		Condition	on Category	
-	raneer	Optimal	Suboptime!	Marginal	Poor
	6. Charmel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization passert, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be passert, but accent channelization is not passert.	Channelization may be extensive; embandments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Barks showd with gabion or coment; over 80% of the stream reac channelized, and
	SCORE 15	20 19 18 17 1	s 15 14 [13/12 (XX)	10 9 8 7 6	5 4 3 2 1 0
mpling reach	7. Charmel Simustry	The bends in the stream immease the stream length 3 to 4 times longer than if it was in a smalght lime. (Note-charmed braiding is considered mornal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times inniger than if it was in a straight line.	The bends in the stream increase the stream length 2 to I times longer than if it was in a smarght line.	Channel straight; waterway has been channelized for a long distance.
E	SCORE 5	20 19 18 17 16	15 13 12 11	10 9 8 7 6	5 4 3 2 1 0
to he evaluated broader than	(reme each bank)	Banks stable; evidence of erosion or bank fainte absence minimal; little potential for future problems. <5% or bank affected.	Moderately stable; infequent, small areas of erosion mostly healed over. \$-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion, high enssion potential during floods.	Unstable; many erode areas; "aw" areas frequent along straight sections and bends; obvious bank shoughing; 60-100% of 0 ank has erosional scars.
1 4	SCORE (LE)	Left 5 trik 10 6	8 7 6	5 4 3	2 1 0
	SCORE 1 (RB)	Right Bank 10 (9)	8 7 6 -	S 4 3	2 1 0
Parameters (a	4/4	Mose than 90% of the susantianic surfaces and immediate inparian time covered by native vegetation, including trees, understony surfaces, or nonwoody maniphyres; vegetative disruption through graing or mowing minimal or not evident, aimost all plants allowed to grow raturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent, more than one-half of the potential plant stubble length remaining.	50-70% of the strandard numbers covered by regelation, disruption obvious; patches of base soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the sceambank surfaces covered by regetation; disruption of streambank regetation has been removed in Sceambank or less in average studie negrit.
	SCORE 2 (LB)	Left Bank 10	8 6 6	5 4 3	2 l g
ŀ	SCORE 7 (RB)	Right Bank 10	8 7 6	5 4 3	2 1 0
	10. Riparian Vermative Zone Width(score each	Width of reparish none >18 meters; human activities (i.e., pasking lots, roadbeds, clear-cuts, lawns, or croops) have not impacted zone.	Width of siparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian more 6- 12 meters; lauman activities have impacted more a great deal.	Width of riparian mrs. 6 meters: little or m riparian vegetation due to imman activities.
	SCORE 5 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 l 0
	SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

STREAM NAME Phillips Pond	LOCATION Waburn
STATION # SD63 RIVERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET#	AGENCY
INVESTIGATORS	
FORM COMPLETED BY	DATE AN PN REASON FOR SURVEY

	Habitet Parameter	Condition Category							
	Puneer	Optimal	Suboptimal	Marginal	Peer				
	L Epifamal Substrate/ Substrate/ Available Covex Available Covex and fish cover, my snags, submerged undercut banks, co or other stable hab and at stage to alle colonization poter (i.e., logs/snags the not new fall and gitransient).		30-50% mix of stable habitat, well-suited for full colonization potential; adequate habitat for maintenance of populations; passerve of additional substrate in the form of mewfall, but not yet prepared for eclonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.				
1	SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	-5 4 3 2 1 0				
in sampling reach	2. Poul Substrate Characterization	Mixtuse of robstrate materials, with gravel and firms and prevalent; not mats and submerged vegetation common.	Mixtue of soft sand, mud, or clay; mud may be dominant, some noot mab and submerged vegetation passent.	All and or clay or sand bottom; little or no root mat, no submerged vegetation.	Hard-pan clay or bedrock; no mot mat or vegetation.				
1	SCORE	20 19 18 17 16	(13) 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0				
to be evaluated	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.				
5	SCORE 1481	20 19 18 17 16	15 14 13 12 11	IO 9 8 7 6	5 4 3 2 1 0				
Parsoneters	4. Sediment Deposition	Little or no enlargement of is lands or point bars and less than 5% < 20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in barformation, mostly from gravel, s and or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, and bends; moderate deposition of people prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.				
	SCORE	20 (19) 18 17 16	15 14 13 12 1	10 9 8 7 6	5 4 3 2 1 0				
	5. Chernel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Waterfills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or rifle substrates are mostly exposed.	Very little water in charmel and mostly present as standing pools.				
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0				

Γ	Habitat	The section of	÷ ;					1.1	·			
	Parameter	Opti	imal	Τε	uboptin	···	n Cobego	Morgin	- 	7	Poor	
	6. Channel Alteration	Channelization dredging absorbing minimal; sire mozemal patter	onor entor entwith	Some ch present, of bridge evidence chamelin dredging past 20 y present, t chamelin present.	usually e abutes e of past zation, i (great r) may but more	ation in areas ents; er than be mi	Charme extensiv or short present and 40	lization re; emba ing struc on both to 80% o hanneliz	may be infoments tures banks; of stream	gabior 80% o chame disrup habitat	showd v or cenu f the stre lized an ed. Inst	vith ent; over earn reach d rearn altered or
	SCORE	20 19 18	8 17 16	15 14	13	12 (1)	10 5	8	7 6	5 4	3 2	1 0
rampling reach	7. Channel Simusity	The bends in increase the s length 3 to 4 longer than if straight line, charmed braid considered no coastal plans low-lying are parameter is r rained in these	tream times it was in a (Note- ing is remal in and other as. This soft easily	The beni increase length 2 longer th straight h	the stream 3 time to 3 time an if it s	es Es	increase length 2	the stre to 1 tin han if it		WATERW	el straigh ay has b lizzed for e.	een
1	SCORE	20 19 18	17 16	15 14	13	12 11	10 9	8	7 6	5 4	2	1 0
Parsoneters to be evaluated broader than	2. Bank Stability (score each bank)	Banks stable; of erosion orbab sent or mini potential for firm problems. <50 affected.	ank failure imal; little iture	Moderate influence erosion in over. 5-3 reach has erosion.	s, small costly h 10% of b	areas of saled sank in		bank in erosion		areas; frequent sections obvious 60-100	le; many zew " ave it along s s and ber s bank sl % of ban al scars.	as traight nds; oughing;
7	SCORE(LB)	Left Bank	10 9	(/8)	7	5	5	4	3	2	1	0
	SCORE(RB)	Right Bank	10 9	8	7	6 -	5	4	3	2	1	0
Parroneters to	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	Mose than 90° streamb ark surinmediate rip- covered by nat vegetation, inci- trees, undersito or nonwoody macrophyles; in disruption timo grazing or most minimal or rot almost all plant to grow ratura.	rianes and ananzone tive chiding ry shrubs, regetative right wing it evident, its allowed	70-90% or stite amb ar covered b vegetation of plants in represents evident but full plant potential to extent, me half of the stubble he remaining	mk surface y malive n, but on us not we ed; dismo it not all growth to any g one than a potenti- inght	ne class ell- ption Recting reat	50-70% stmamba covered disruption patches of closely of vegetation than one potential height re	by vege in obvious of base so cropped on community half of	tation; us; oil or non; less the ubble	streamb covered disrupti vegetati remove 5 centir	onis ve onbas b	tation; eambank ry high; een
	SCORE(LB)	Left Bank	(10	8	7	6	5	4	3	2	1	0
	SCORE(RB)	,	10	8	7	6	. 5	4	3	2	1	0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of ripant >18 meters; hur activities (i.e., lots, roadbeds, lawns, or crops impacted zone.	man parking clear-cuts,) have not	Width of r 12-18 met activities I zone only	ers; hur have im	nan parted	Width of 12 meter activities zone a gr	s; huma have in	n apacted	<6 mete	f riparia es: little vegetati in activit	orno en due
												
	SCORE(LB)	Left Bank	10 9	8	7	6	. 5	4	3	2	/1 Y	0

STREAM NAME Ph.// hs Conl	LOCATION	
STATION # SD - 3 RIVERMILE	STREAM CLASS	
LATLONG	RIVER BASIN	
STORET#	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY	DATE AM PM	REASON FOR SURVEY

	Habitat Parameter		Condicio	n Category	
	rander	Optimal	Suboptimal	Marginal	Poor
	1. Epifamal Substrate/ Available Cover	Greater than 37% of substrate favorable for epifamal colonization and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for manuscance of populations; passence of additional substate in the form of newfall, but not yet papared for colonization (may rate at high end of scale).	10-30% mix of stable habitat, habitat availability less than desizable; mostrate fæquently disturbed or removed.	Less than 10% stable habitat, lack of habitat is onvious; substrate unstable or lacking.
AC.	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
to he exhibited in sampling reach	2 Poul Substrate Characterization	Mixture of substants materials, with gravel and firms and prevalent, root mate and sub-marged vegetation common.	Mintue of soft sand, mud, or clay, and may be dominant, some mot main and sub merged vegetation passent.	All rand or clay or sand bottom; little or no root mat, no submerged vegetation.	Hard-panciay or bedrock; no not mat or vegetation
3	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 (7) 6	5 4 3 2 1 0
he erahu	3 Poul Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
1 5	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameter	4 Sediment Deposition	of is lands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, s and or fine sediment; 5-30% (20-30% for low-gradient) of the bottom affected; s light deposition in pools.	obstructions,	Heavy deposits of fine material increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently, pools almost absent due to substantial sediment deposition.
] ,	5CORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5)43210
	5. Charanel Flory Status	both lower banks, and minimal amount of	<25% of channel	available channel, and/or niffle substrates are	Very little water in charnel and mostly passent as standing pools.
	SCORE	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Γ	Habitat		Conditi	ол Саведжу	
	Parameter	Optimal	Subortimel	Mareinal	Puor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization passent, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging (greater than past 20 yr) may be passent, but accent channelization is not passent.	Channelization may be extensive; embandments or shoring structures present on both banks; and 40 to 80% or stream reach channelized and disrupted.	80% of the stream reach charmelized and
	SCORE	20 19 18 17 (16	15 14 13 12 (1	10 9 8 7 6	5 4 3 2 1 0
oline seed.	7. Channel Sinus sity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - charmed braiding is considered normal in coastal plans and other low-lying area. This parameter is not easily rand in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Charmel straight; waterway has been charmelized for a long distance.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5)4 3 2 1 0
Parameters to be evaluated broader than sameling second	& Bank Smbility (score each bank)	Banks stable; evidence of environ or bank failure absent or minimal; little potential for future problems. <5% or bank attented.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable; many eroded areas; "aw" areas frequent along straight sections and bends; obvious bank shooting 60-100% of bank has erosional scars.
1	SCORE(LB)	Left Bark 10 9	8 7 6	5 4 3	2 1 0
	SCORE(RB)	Right Bank 10 (9)	8 7 6 -	5 4 3	2 l 0
Parameters to	9. Vecesative Protection (score each bank) Note: determine left or right side by fices downstream.		70-90% of the steambank surfaces covered by native vegetation, but one class of plans is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than orehalf of the potential plant stubble height remaining.	50-70% of the steambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubb is height remaining.	Less than 30% of the steambank surfaces covered by veg claims; disruption of streambank vegetation is very high vegetation has been removed to 5 comments or less may average stubble neight
İ	scoks_(L3)	Left Bank 10	8 (7 6	5 (4) 3	2 1 0
	SCORE(RB)	Right Bank 10	8 7 6	5 4 3	2 1 0
	10. Riparism Vegetative Zone Waith (scom each bank spanan zone)	>18 neter; human activities (i.e., parking	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian more <6 meters: little or mo mparian vegetation due to imman activities.
İ	SCORE (LB)	Left Bank 10 9	8 7 (6),	5 4 3	2 1 0
Į	SCORE(RB)	Right Bunk 10 9	8 7 (4)	5 4 3	2 1 0

STREAM NAME Phillips Pond	LOCATION WARDEN
STATION # SD63 RIVERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET#	AGENCY
INVESTIGATORS	
FORM COMPLETED BY	DATE AM PM REASON FOR SURVEY

Γ	Habitat Parameter	7-1-4 1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	Condition	Cadegory	
	- Turker	Optimal	Subaption.i	Marginal	Poor
	l. Epifounal Substrate/ Available Cover	Greater than II% of substrate favorable for epifamal colonization and fish cover, mix of snags, submerged logs, undernot banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat, well-suited for full colonization potential; adequate habitat for maintenance of population; potential of additional substrate in the form of newfall, but not yet papared for explorization (may rate at high and of scale).	10-30% max of stable habitat, habitat availability less than desirable; rubstrate frequently disturbed or removed.	Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.
Tauch.	5CORE	20 19 (18) 17 16	15 14 15 12 11	10 9 8 7 6	-5 4 3 2 1 0
In seasy ling to	2: Perd Substrate Characterization	Mixture of Pubstrate mountide, with gravel and firms and prevalent, root mab and sub marged vegetation common.	Mirchine of soft sand, modernesslay; modernay- be dominant, some most mais and submerged vegetation passent.	All mid or clay or said bottoms light or no cost mat, no submerged vegetation.	Hard-pan clay or bedrock no not mat or vegetation.
1	SCORE	20 19 18 17 16	(IS) 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
be evalua	2 Poul Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
5	SCORE NAT	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameters to	4. Sediment Deposition	Little or no enlargement of is lands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment, 5-30% (20-30% for low-gradient) of the bottom affected; slight deposition in pook.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30–50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, and bends; moderate deposition of path, prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently, pools almost absent due to substantial sediment deposition.
	SCORE	20 (19) 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Charmel Flow Status	Water maches base of both lower banks, and minimal amount of channel substrate is exposed.	Waterfills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or nifle substrates are mostly exposed.	Very little water in channel and mostly passent as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 I 0

Γ	Habitat	Condition Category 524.7				
	Parameter	Optimal		2.342	P	
	6. Charmel Alteration	Channelization or dredging absent or minimal, streamwith normal pattern.	Some channelization puters, usually in are of bridge abutments; evidence of past chamblization, i.e., dredging, (greater than past 20 yr) may be puters, but accent chamblization is not puters.	or shoring structures present on both banks; and 40 to 80% of stream	80% of the stream reach charmelized and	
	SCORE	20 19 18 17	16 15 14 13 12	1) 10 9 8 7	6 5 4 3 2 1 0	
than earn three reach	7. Channel Sinus sity	This bands in the stream increase the stream length 3 to 4 times longer than if it was in straight line. (Note channel braiding is considered monal in coastal plants and other law-lying are st. This parameter is not easily rated in these areas.	ituresse the stream length 2 to 3 times longer than if it was in straight line.	increase the stream length 2 to 1 times	waterway has been charmelized for a long	
1 5	SCORE	20 19 18 17	16 13 14 13 12	1 10 9 8 7	5 5 4 0 2 1 0	
be evaluated broader than	E Bank Stability (yeurr each bank)	Banks stable evidence of except of bank last absent or minimal, little potential for future publishes. <5% of bank affected.	erosion mostly healed	areas of erosion; high	Gequent along straight	
Ą	SCORE(LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0	
	SCORE(RB)	Right Bank 10 9	8 7 6	- 5 4 3	2 1 0	
Paremeters to	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understony slumbs or norwoody macrophyles; vegetative disruption through grazing or nowing mummal or not evident, almost all plants allowed to grow raturally.	covered by rative regetation, but one class of plants is not well-represented; disruption evident but not affective full plant growth potential to any great extent; more than one-half of the potential plants.	patches of base soil or closely cropped vegetation common; less than one-half of the potential plant stubble legisht remaining.	Less than 30% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
	SCORE(LB)	Left Bank 10	8 7 6	5 4 3	2 1 0	
	SCORE(RB)	Right Bank 10	8 7 6	.5 4 3	2 1 0	
	lf. Riperion Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., pasking lots, readbeds, clear-cut- lawas, or crops) have no impacted zone.	×	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or zo riparian vegetation due to human activities.	
	SCORE(LB)	Left Bank 10 9	8 7 6	5 4 3	2 /1 0	

STREAM NAME Hells Breck	LOCATION
STATION # SD - 4 RIVERMILE	_ STREAM CLASS
LATLONG	RIVER BASIN
STORET#	AGENCY
INVESTIGATORS	
FORM COMPLETED BY	DATE - REASON FOR SURVEY

Habitat		Cale	egory	
Parameter	Optimal	Suboptimat	Marginal	Poor
l. Epifaunai Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	10-50% mix of suble habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 (17) 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2.Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan ciny or bedround no root mat or vegetation.
SCORE	20 19 18 (17) 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Variability SCORE	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
	Channelization or	Some channelization	Channelization may be	Banks shored with gabion
4. Channel Alteration	dredging absent or minimal; stream with normal pattern.	present, usually in areas of bridge abutments; evidence of past 'nannelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 (10)	10 9 8 7 6	5 4 3 2 1 0

Habitat	Category					
Parameter	Optimal	Suboptimal	Marginal	Poor		
6. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.			
SCORE	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0		
7. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or rifle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.		
SCORE	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1 0		
8. Bank Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces covered by native vegetation, including trees, understory shrubs, or nortwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.		
SCORE(LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0		
9. Bank Stability (score each bank)	Right Bank 10 9 Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.		
SCORE(LB)	Left Bank 10 9	<u>8</u> 7 6	5 4 3	2 1 0		
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0		
10. Ripariau Vegetative Zode Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	18 meters; human activities have inpacted	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.		
SCORE (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0		
SCORE (RB)	Right Bank (10 / 9	8 7 6	5 4 3	2 1 0		

~	Score	

STREAM NAME SD - 64 Halls Brook	LOCATION	***
STATION # SD . U Y RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY Back Hoskins	DATE 6-17-99 AM PM	REASON FOR SURVEY

Habitat	Category				
Parameter	Optimal	Suboptimat	Marginal	Poor	
I. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
Z.Pool Substrate Characterization SOFF	20 19 18 17 (16) Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common. 20 19 18 17 16	15 14 (13) 12 11 Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present. 15 (14) 13 (12) 11	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	5 4 3 2 t 0 Hard-pan clay or bedroc. no root mat or vegetation.	
3. Pool SOV Variability 6	20 19 18 17 16 Even mix of large- shallow, large-deep, small-shallow, small-deep poots present. 20 19 18 17 16	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.	
4. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past 'tannelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channetized and disrupted. Instream habitat greatly altered or removed entirely.	
SCORE 19	20 (19) 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
5. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 10-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low- gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
SCORE X	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0	

Habitat Category				
Parameter	Optimal	Suboptimal	Marginal	Poor
6. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	1
SCORE #	20 19 18 17 16	15 14 13 (12) 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 14	20 19 18 17 16.	15 (74) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetacion, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 (6)	8 7 6	5 4 3	2 1 0
9. Bank Stability (score each bank)	Right Bank 10 (1) Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of crosion mostly healed over. 5-30% of bank in reach has areas of crosion.	5 4 3 Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional sears.
SCORE (LB)	Left Bank 10	8 7 6	5 4 3	2 t 0
SCORE 1 (RB)	Right Bank 10 (9)	8 7 6	5 4 3	2 1 0
16. Riparias Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12- 18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 🎉 (LB)	Left Bank 10 9	Ø 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0

Total	Score	

STREAM NAME HALLS GOOD FOR	LOCATION	
STATION # SDUY RIVERMILE	STREAM CLASS	
LATLONG	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY	DATE 12.45 REASON FOR SURVEY LETTER AM PM RT / F 5	

Habitat	Category			
Parameter	Optimat	Suboptimal	Marginal	Poor
I. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 (12)11	10 9 8 7 6	5 4 3 2 1 6
2.Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; ao submerged vegetation.	Hard-pan clay or bedroc.; no root mat of vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0
3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
SCORE Y	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 (2) E 0
4. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past namelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
S. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
			pools prevalent.	

Habitat		Ca	tegary	-
Parameter	Optimal	Suboptimal	Marginal	Poor
6. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 (14)13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB) SCORE (RB)	Left Bank 10 9 Right Bank 10 9	8 7 6 8 7 6	5 4 3	2 1 0
9. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional sears.
SCORE [C](LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE (1) (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 merers; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not	Width of riparian zone 12- 18 meters; human activities have impacted zone only minimally.	12 meters; human activities have impacted	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	impacted zone.		}	
SCORE (D) (LB) SCORE (RB)	impacted zone. Left Bank (10 9 Right Bank (10) 9	8 7 6	5 4 3	2 1 0

Alders

grass + purple lissestrife

right bank 15 1855 Shadla

STREAM NAME HBHA Poul	LOCATION	
STATION #5-7 RIVERMILE	STREAM CLASS	
LATLONG	RIVER BASIN	
STORET#	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY	DATE AM PM I	REASON FOR SURVEY

	Habitat Parameter	Condition Category				
	Farancer	Optimal	Suboptimal	Marginal	Poor	
	2. Epifamal Substrain/ Available Cover	Greater than 50% of substrate favorable for epifamial colonization and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat, well-suited for full colonization potential; adequate habitat for manuscance of populations; passence of additional substrain in the form of newfall, but not yet papared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat, lack of hab itat is obvious; substrate unstable or lacking.	
10.42	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 (4) 3 2 1 0	
Parameters to be evaluated in sampling reach	2. Peol Substrate Characteristics	Mixture of substrate materials, with gravel and firms and prevalent, not mate and submerged vegetation common.	Mixime of soft sand, mud, or clay, mud may be dominant, some mot mais and submerged regetation present.	All mid or clay or sand bottom, little or no root mat, no sibmerged vegetation.	Hard-panciay or bedrock; no not mat or vegetation.	
3	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0	
be erahu	1. Pool Veriability		Majority of pools large- deep; very few shallow.		Majority of pools small- shallow or pools absent	
T G	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
Paramete	4 Sediment Deposition	of is lands or point bars and less than 5% <20% for low-gradient stmams) of the bottom affected by sediment deposition.	bar formation, mostly from gravel, s and or fine sediment, \$20% (20-20% for low-gradient) of the bottom affected; s light deposition in pools.	new gravel, sand or fine sediment on old and new bars; 30–30% (50-80% for low-gradiers) of the bottum affected; sediment deposits at obstructions, constructions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently, pools almost absent due to substantial sediment deposition.	
	5CORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5')4 3 2 1 0	
	5. Channel Flow Sparus	both lower banks, and minimal amount of	vailable channel; or <25% of channel	available channel, and/or online substrates are	Very little water in charmel and mostly present as standing pools.	
	5CORE	20 19 18 17 16	15")14 13 12 11	10 9 8 7 56	5 4 3 2 1 0	

STREAM HAME HBHH Pond	LOCATION WO DUIN
STATION DD.567 RIVERMILE	STREAM CLASS Fond
LATLONG	RIVER BASIN
STORET#	AGENCY
INVESTIGATORS	
FORM COMPLETED BY	DATE AM PM REASON FOR SURVEY

	Habitat	Condition Category				
Parameters to be evaluated in sampling reach	Parameter	Optimal	Suboptimal	Marginal	Poor	
	1 Epiformal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifamial columization and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat, well-suited for full colonization potential, adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 (6)	5 4 3 2 1 0	
	2. Poel Substrate Characterization	Mixture of substrate materials, with gravel and firms and prevalent, most mate and submerged vegetation common.	Mixtue of soft sand, mud, or clay, mud may be dominant, some mot mats and sub merged vegetation passent.	All mid orclay orsand bottom; little or no root mat, no submerged vegetation.	Hard-pan clay or bedrock; no not mat or vegetation.	
3	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
be evalua	3. Poul Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large- deep; very few shallow.	Shallow pools much more pievalent than deep pools.	Majority of pools small- shallow or pools absent.	
5	SCORE U	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
Parmeter	4. Sediment Deposition	Little or no enlargement of is lands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, s and or fine sediment; 5-30% (20-30% for low-gradient) of the bottom affected; s light deposition in pools.	Moderate deposition of new gravel, sand or fire sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently, pools almost absent due to substantial sediment deposition.	
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 (4) 3 2 1 0	
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.		Very little water in channel and mostly passent as standing pools.	
	SCORE	20 (19) 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	

Γ	Habita	1.5			, e (Conditi	om Cade		**				<u>-</u>
	Perameter	Optimal		5.	bopti	mal		Mar	ginel E		P	00T	
	6. Channel Alteration	Channelization or dredging absent or minimal; stream winormal pattern.		Some chi present, to of bridge evidence channelis dredging part 20 y present, to channelis present.	abuta of pas ation, (grea r) may ut sec	r in areas nents; it i.e., ter than be ent	extenders or ship the same of	sive; er oning st ent on b 10 to 80	on may be mbankmer nuctures oth banks % of strea dized and	nts gabie 80% chan dism habit	nelized pted. I	trea and nstre tly al	t;over ntrack an and tered or
	SCORE	20 19 18 17	7 16	15 14	13	12 11	10	9 8	3 7	6 (5)	4 3	2	1 0
p ing reach	7. Channel Simuocity	The bends in the stream length 3 to 4 times longer than if it was straight line. (Note charmel braiding is considered normal icostal plains and to low-lying areas. The parameter is not eas rated in these areas.	in ther	The bend increase length 2 longer the straight is	he stri o 3 tir un if it	eam. Des	incre lengt longe	ase the s h 2 to l		wate: chan	mel stra way ka nelized nce.	s bee	п
Ę	SCORE	20 19 18 17	16	15 14	13	12 11	10	9 8	3 7	6 5	4 3	2	1) ō
erahated broader than rampling reach	2. Hank Stability (score each bank)	Banks stable; evide of erosion or bank f absent or minimal; I potential for future publishers. <5% of t affected.	autore Little	Moderate infraquent erosion m over. 5-3 reach has erosion.	smal ostly l I%of	l áreas có realed bank in	50%	of erosi of erosi	nstable; 3 in reach h on; high tial during	fieque section obvio 60-10	ble; rea ; "zw" ert alon ers and l us bank U% of b oral sca	ameas ig str bend skoo ank	aight ghing
4	SCORE(LB)	Left Bank 10	9	8	1/2	6	5	4	3	2	1		0
	SCORE(RB)	Right Bank 10	9	8	(7)	6	5	4	3	2	1		0
Parameters to be	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	Mose than 90% of the streambank surfaces immediate riparian a covered by native vegetation, including trees, understory simple or nonwoody macrophytes; vegeta disruption through grazing or mowing minimal or not evide almost all plants allo to grow naturally.	and cone ubs, tive	70-90% or streamb an covered by vegetation of plants is represente evident but full plant; potential textent, mo extent, mo extent, mo extent, more trubble he remaining	k surfi y native , but of not well; disr t not a powth potent jet	re pre-class rell- uption affecting treat n one-	stream cover disrug patch closel veget than o potent height	tion ob es of bas y cropp ation co ne-kalf	maces igetation; vious; e soil or ed rumon; les of the t stubble	stream cover disrup veget veget s remov S cent	han 30; nb ank se of by we of them of attent is attent ha red to irreters to stubb	urfar egeta strea very s bee	es tion; mbank high; n ss in
	SCORE(LB)	Left Bank 10		8	(A)	6	5	4		2	1		0
	SCORE(RB)	Right Bank 10		8	7)	5	5	4	3	2	1		0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian 20 >18 meter; human activities (i.e., paskii lots, roadbeds, clear- lawzs, or crops) haw impacted zone.	ng cuts,	Width of r 12-18 met activities I zone only	ave in	man npacted	12 me	ters; hu	impacted	<6 me 1 прада	of ripa dens: lit n veget man acti	le or ation	200 due
	SCORE(LB)	Left Bank 10	9	8	7	6	5	4	3	2	$\sqrt{1}$	1	0
1	SCORE(RB)	Right Bank 10	_	8	7	6	5	4	3	2	1		0

STREAM NAME HBHB Bond	LOCATION		
STATION #505-7 RIVERMILE	STREAM CLASS		
LATLONG	RIVER BASIN		
STORET#	AGENCY		
INVESTIGATORS			
FORM COMPLETED BY BAN MAN	DATE		

	Habitat Paramegu		Condition	a Calegory	
	- Francisco	Optimal	Suboptimal	Marginel	Poor
	l Epifamal Substrate/ Available Cover	Greater than 30% of substrate favorable for epifamal colorimation and fish cover, mix of snags, submerged logs, undercut banks, cob ble or other stable habitat and at stage to allow full colorimation potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat well-suited for full colomization potential; adequate habitat for mammanance of populations; perferre of additional substrate in the form of newfall, but not yet prepared for colomization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.
ac)	SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
be evaluated in sampling reach	Z Pool Substrate Characterization	Mixtue of substate materials, with gravel and firms and prevalent, root mab and submerged regetation common.	Mirrors of soft sand, mud, or clay, mud may be dominant, some mot main and submerged regetation passent.	All mnd or clay orsand bottom; little or no root mat, no submarged vegatation.	Hard-pan clay or bedrock; no not mat or vegetation
8	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1 0
be evalua	3. Pool Variability	Even mir of large- shallow, large-deep, small-shallow, small- deep pools present.	deep; very few shallow.		Majority of pools small- shallow or pools absent
3) 2.57	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameters to	4 Sediment Deposition	Little or no enlargement of is lands or point bars and less than 5% <20% for low-gradient stream) of the bottom affected by sediment deposition.	bar formation, mostly from gravel, sand or fine sediment; 5-20% (20-30% for low-gradient) of the bottom affected; slight deposition in pools.	new gravel, sand or fine sediment on old and new bars; 30–51% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom hanging frequently, proposed almost absent due to substantial sediment deposition.
	score う	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
	5. Charmel Flow Status		available channel; or <25% of channel	available channel, and/or of	Very little water in charmel and mostly present as standing cools.
	SCORE 17	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Γ	Habitat		Conditio	on Category	
	Parameter	Optimal	Suboptimel	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Barks showed with gabion or mement; over 80% of the stream reach channelized and discipled. Instream habitat greatly altered or removed entirely.
	SCORE 3	20 19 18 17 16	15 14 13 12 11	(No.) 9 8 7 6	5 4 3 2 1 0
pling reach	7. Channel Simustry	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight lime. (Note charnel braiding is considered normal in courtal plains and other low-lying near. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
1 4	score 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 1
Parameters to be evaluated broader than sampling roach	2. Benic Subility (scure each bank)	Banic stable; evidence of crossen or bank fainte absent or minimal; little potential for fature products. <5% of bank affected.	Moderately stable; inflequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable: 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many erode, area; "now" areas frequent along straight sections and bends; obvious bank since frequent of the has erosional scars.
=======================================	SCORE 7 (LB)	Left Sank 10 9	8 <i>G</i>) 6	5 4 3	2 1 0
2	SCORE 7 (RB)	Right Bank 10 9	8 9 6 -	5 4 3	2 I O
Parameters to	9. Vegrative Protection (score each bank) Note: determine left or right side by facing downstream.	aimost all plants allowed	70-90% of the steambank surfaces covered by native vegetation, but one class of plants is mot well-remeanted; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	vegetation common; less than one-half of the	Less than II% of the streambank surfaces covered by vegetation; disruption of streambank vegetation in very high; vegetation in as been removed in S certification or less in average stubble height
	SCORE <u>(L3)</u>	Left Eark 10	8 7 🕝	5 4 3	2 1 0
Į	SCORE (RB)	Right Bank 10	8 7 6	5 4 3	2 1 0
	10. Riparian Vegenative Zone Width (score each bank mparian zone)	>18 meters; human activities (i.e., parking	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	12 meters; human activities have impacted	Width of riparian mre <6 meters: little or m riparian vegriation due to imman activities.
[SCORE 2 (LB)	Left Bank 10 9	8 7 6	Q 4 3	2 1 0
	SCORE A (RB)	Right Bank 10 9	8 7 6	(<u>5</u>) 4 3	2 1 0

STREAM HAME HAMH	LOCATION	
STATION # Sh & RIVERMILE	STREAM CLASS	
LATLONG	RIVER BASIN	
STORET#	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY	DATE AH PM	REASON FOR SURVEY

Г	Habitat Parameter		Conditio	a Category	
	Tarancer -	Optimal	Suboptimal	Marginal	Poor
()	1. Epifamal Substrate Available Cover	Greater than 30% of substrate favorable for epifamial colorination and fish cover, mix of snags, submerged logs, underrut banks, cobole or other stable habitat and at stage to allow full colorination porarbial (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat, well-suited for full colorization potential; adequate habitat for mamenance of populations; presente of additional substrate in the form of newfall, but not yet prepared for colorization (may rate at high end of scale).	10-30% mix of stable habitat, habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.
45	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	2 Pool Substantian	Mixtue of substate materials, with gravel and firms and prevalent, root mate and sub merged vegetation common.	Mixime of soft sand, mid, or clay, mid may be dominant, some mot man and submerged regetation piesers.	All mid or clay or sand bottem; little or no mot mat, no monerged registation.	Hard-panciay or bedrock; no not mat or vegetation
1 20	SCORE	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	\$ 4 3 2 1 0
be evalua	1 Pool Variability	Even mix of large- shallow, large-deep, small-snallow, small- deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
5	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Paramet	4 Sediment Deposition	of is lands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	bar formation, mostly from gravel, s and or fine sediment, 5-30% (21-30% for low- gradient) of the bottom affected; slight deposition in pools.	new gravel, sand or fine sediment on old and new bars; 30-30% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions,	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently, pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 (13)12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Chaymal Flow Startus	both lower banks, and minimal amount of	substrate is exposed.	available channel, and/or nifle substrates are mostly exposed.	Very little water in charmel and mostly pies ent as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Γ	Habitat		Condition	on Canguiy	
	Parametr	Ortimal	Subsotimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; streamwith normal pattern.	Some channelization passent, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging (greater than past 20 yr) maybe present, but secent channelization is not passent.	Channelization may be extensive; embandments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	80% of the stream reach
İ	5CORE	20 19 18 (17) 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
ranyling reach	7. Charmel Sinus sity	The bends in the stream immesse the stream length 3 to 4 times longer than if it was in a straight time. (Note - charmed braiding is considered momai in coastal plaims and other low-lying area. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Charmal straight; waterway has been charmelized for a long distance.
l u	SCORE	20 19 13 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameters to be evaluated broader than	2. Bank Smbility (seems cash bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future publicus. <5% or bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. \$-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential many floods.	Untable; many eroded areas; "aw" areas frequent along straight sections and bends; obvious bank salong integral 60-100% of bank has erosional scars.
4	SCOPE (LB)	Left Sank 10 (2)	8 7 6	5 4 3	2 1 0
2	SCORE(RB)	Right 3 and 10 (9)	B 7 6 -	5 4 3	2 1 0
Paraneters to	9. Verrative Protection (score each bank) Note: determine left or right side by faces downs tream.	disruption through graining or moving minimal or not evident, almost all plants allowed	70-90% of the streambank surfaces covered by native vegetation, but one class of plant is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the steambank suffaces covered by wegetation; disruption obvious; patches of bars soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 30% of the smeant and surfaces covered by vegetation; distribution of streambank vegetation has been removed to 5 comments or less to average stubole height.
	SCORE(LB)	Left Bazir 10	8 7 6	5 4 ' 3	2 1 0
	SCORE(RB)	Right Bank 10	8 7 (6)	5 4 3	2 1 0
	10. Ripariza Vegenative Zone Width (score each bank inparient zone)	>18 meters; human activities (i.e., parking	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian mre <6 meters: little or mo mparian vegetation due to imman activities.
Ī	SCORE (LB)	Left Bank 10 9	8 7 6	(5) 4 3	2 1 0
	SCORE(RB)	Right Bank 10 9	8 7 6	(5) 4 3	2 1 0

STREAM NAME H13	LOCATION
STATION # SDD8 RIVERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET#	AGENCY
INVESTIGATORS	
FORM COMPLETED BY	DATE AN PM REASON FOR SURVEY

	Habitat Parameter	<u> </u>	Condition	n Category	
	P41-GALET	Optimal	Suboptimal	Marginel	Poor
	1. Epiformal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifannal colonization and fish cover, mix of snags, submerged logs, undercut banks, cobbile or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; passerize of additional substrate in the form of newfall, but not yet papared for colonization (may rate at high and of scale).	10-30% mix of stable habitat, habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat, lack of lab itat is obvious; substrate unstable or lacking.
5	SCORE	20 19 18 17 16	15 14 13(12)11	10 9 8 -7 6	5 4 3 2 1 0
Parrometers to be evaluated in sampling reach	2. Pool Substrate Characterization	Mixtue of substrate materials, with gravel and firms and prevalent; not mate and submerged vegetation common.	Mixtum of soft sand, much, or clay; mud may be dominant, some noot mats and submerged vegetation pussent.	All mind or clay or sand botken; little or no mot mat, no submerged vegetation.	Hard-panelay or bedrock; no not mut or vegetation.
3	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
o be evalue	3 Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
1	SCORE PR	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Paramet	4. Sediment Deposition	Little or to enlargement of is lands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, s and or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; s light deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, and bends; moderate deposition of pools payvalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently, pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1 0
	5. Charmel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Waterfills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or rifle substrates are mostly exposed.	Very little water in charmel and mostly present as standing pools.
	SCORE	20 19 18 ⁽¹ 7) 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

	Habitat	<u> </u>		n Category 5 (1975)	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization passent, usually in areas of bridge abutiments; evidence of past channelization, i.e., dredging, (greater than past 20 yz) may be passent, but accent channelization is not passent.	Channelization may be extensive; embandments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks showd with gabion or cement; over 80% of the stream reach charmelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
pling reach	7. Charmel Simuscity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note charmel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 (2)1 0
De evelanted broader than mapping reach	8. Benk Stability (reare each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable; many eroded areas; "zaw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
	SCORE(LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
Ì	SCORE(RB)	Right Bank 10 9	8 7 6 -	5 4 3	2 l 0
CI KINDUCKTK J	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian none cowered by native vegetation, including trees, understory slmbs, or nonwoody macrophytes; vegetative disruption thangh graining or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the stmambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the steambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
١	SCORE(LB)	Left Bank 10	8 7 [6]	5 4 3	2 1 0
	SCORE(RB)	Right Bank 10	8 7 6	5 4 3	2 1 0
	10. Riparism Vegetative Zone Width (score each bank nparian zone)	activities (i.e., parking	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 maters: little or no riparian vegetation due to human activities.
	SCORE(LB)	Left Bank 10 9	8 7 6	S 4 3	2 1 0
Į	SCORE(RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score

digital is close

STREAM NAME	HBHA	LOCATION	Joburn
STATION # 5 DOC	RIVERMILE	STREAM CLASS	
LAT	LONG	RIVER BASIN	
STORET#		AGENCY	
INVESTIGATORS			
FORM COMPLETED E	KD	DATE TIME	REASON FOR SURVEY

	Hebitat		/ Condition	n Calegory	
	Permeer	Optimal	Subop time!	Marginal	Poor
	1 Epifamal Substrate/ Available Cover	Greater than 30% of substrate favorable for epifamal columnation and fish cover, mix of snags, nomerged logs, underent banks, cobble or other stable habitat and at stage to allow full colormation potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat, well-suited for full colonization potential, adequate habitat for maintenance of populations; presence of additional substrain in the form of newfall, but not yet papared for colonization (may rate at high emi of scale).	10-30% mix of stable habitat, habitat habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat, lack of labitat is obvicus; substrate unstable or lacking.
158	SCORE	20 19 18 17 16	15 14 13 (2) 11	10 9 8 7 6	5 4 3 2 1 0
n sampling reach	2 Pool Substrate Characterization	Mixtue of substate materials, with gravel and firms and prevalent; not mab and sub merged regetation common.	Mixium of soft sand, mud, or clay, and may be dominant, some not man and submented vegetation present.	All mid or clay or sand bottom, little or no mot mat, no submerged vegetation.	Hard-panciay or bedrock; no not mat or vegetation
led i	SCORE	20 19 18 17 16	15 14 13 (12) 11	10 9 8 17 6	5 4 3 2 1 0
Parameters to be evaluated in	1 Poel Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large deep; very few shallow.	Shallow pools milels more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
3 5	SCORE	20 19 18 17 16	IS 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Paramet	4 Sediment Deposition	Little or ro enlargement of is lands or point bars and less than 5% < 20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, s and or fine sediment, 5-30% (20-30% for low-gratient) of the bottom affected; sheld deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently, pools almost absent due to substantial sediment deposition.
L	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 (4) 3 2 1 0
	5. Channel Flow Singus	both lower banks, and minimal amount of	Waterfills >75% of the available channel; or <25% of channel substrate is exposed.		Very little water in channel and mostly present as standing pools.
· [SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

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		to the same									
	Habitat				Condit	ion Cate	Some A.	ند ر			
	Parameter	Optimal		Subopi	timal		Merc	inal		Poo	r
	6. Channel Alteration	Channelization or dredging absent or minural; streamwith normal pattern.	present of bridg evidence charmed	e abut se of particular (green) make (green) to the particular (green)	est n. i.e., later than lybe. cent	or she present and 4	sive; emi oring stro or on bot 0 to 80% channeli	n may be bankments ichines th banks; 6 of stream iched and	s de de de de de de de de de de de de de	if the stra elizadi ar red. Insa	ert; over eam reaci ad meam altered o
	SCORE	20 19 18 17 16	15 14	1 13	12 11	10	9 8	7 6	5 5 4	3 ;	2 1 0
pling reach	7. Charriel Strong stry	The bends in the stream immease the stream length 3 to 4 times longer than if it was in a straight time. (Note charmed braiding is considered mormal in coastal plains and other low-lying area. This parameter is not easily rated in these areas.	increase length 2	the str to 3 to		increa length longer	se the str 2 to 1 ti		waters	el straigh vay has b litted for te.	eem
-	SCORE	20 19 18 17 16	15 14	13	12 11	10	9 8	76	(3)4	3 2	1 0
he evaluated broader than campling reach	L Bank Subility (scare each bank)	Banic stable; evidence of ensuing or and fainte absent or minimal; little potential Sir future problems. <5% of bank attented.	eronioz z	et see eostly 30% of	ill areas of healed f bank in	€ 60% a	f earsk in if erosion i potenii	ओ कंग्रांच्या । 	Deas; Deques section covicus 60-100	le; many aw are i along s s and ber s bank sh % of ban al scars	s trick ni; renz
1	SCORE (LE)	Left Bank 10 9	8	7	6	5	4	3	2	1	0
֓֞֞֞֞֞֓֓֓֓֓֓֓֓֓֓֓֓֓֓֡֓֞֡֓֓֓֓֡֡֡֡֡֡֡֡֡֡֡	SCORE (RB)	Right Bank 10 9	8	7	6 -	5	4	3	2	ì	0
Farancia; to	9. Vegnative Protection (score each bank) Note: determine left or noist side by facing downstream.	immediate inparian more covered by native vegetation, including trees, understory similes, or nanewoody macophytes; vegetative disruption through paring or nowing minimal or not evident, amost all plants allowed	of plans: represent evident be full plant potential extent; or	nk suffing but on but of its most of cowell to any one that a potential to the complete of the	ve one class well- uption affecting h	steamicovered disruption patches chosely vegetate than on potentia	of the same such such sort of base cropped ion come e-half of al piants remaining	etation; ous; soil or mon; less the tubb le	Streams covered disrupts vegetab vegetab	en 9% o ank sum by rege on of sum on has be i to mens or sumble i	kes tanna; tanna; tanna; tanna; tanna; tanna;
	CORE (LB)	Left Bank 10	8	[[7]	6	5	4	3	2	1	0
S	CORE (RB)	Right Bank 10	8	7	6	5	4	3	2	1	0
7	O. Riperian Vegeta five Zone Walth (scom each ank siperian zone)	>18 meters; human activities (i.e., pairing	Width of 12-18 met scrivities 1 core only	es; a ave i	man mpacted	12 mete	a; huma	mpacted	<6 mete	f npanian m: little o vegetatio n activity	rao Edua
1 -	CORE ((LB)	Left Bank 10 9	/ 8 /	7	6	5	4	3	2	1	0.
1 2	— — , , i					<u> </u>					

STREAM NAME Halls Brook	LOCATION		
STATION # 50-9 RIVERMILE	STREAM CLASS		
LATLONG	RIVER BASIN		
STORET#	AGENCY		
INVESTIGATORS			
FORM COMPLETED BY Bart Hoskins	DATE AM PM	REASON FOR SURVEY	

	Habitat Parameter		Conditio	n Category	
	1 2 2 2	Op timal	Suboptimal	Marginal	Poor
	L Epifamal Substrate/ Available Cover	Greater than 30% of substrate favorable for epifannal colorination and fish cover, mix of snags, numerged logs, undercut banics, cobble or other stable habitat and at stage to allow full colorination potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat, well-suited for full coionization potential; adequais habitat for mannenance of populations; passence of additional substain in the form of newfall, but not yet perpared for coionization (may rate at high end of scale).	10-30% mix of stable habitat; habitat seitables than desirable; nostran finguently disturbed or removed.	Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.
1 2	SCORE 13	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0
be evaluated in sampling reach	2 Pool Substrate Characterization		Mixture of soft sand, mad, or clay, and may be dominant, some noot mats and sub merged vegetation present.	All mid or clay or sand bother; little or no root mat, no submerged vegetation.	Hard-panciay or bedrock; no not mat or vegetation
	SCORE 13	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	1 Poul Veriability		Majority of pools large- deep; very few shallow.		Majority of pools small- shallow or pools absent
3 5	SCORE S	20 19 18 17 16	15 14 13 12 11	0 9 8 7 6	5 4 3 2 1 0
Parameters	4 Sediment Deposition	of is lands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	bar formation, mostly from gravel, s and or fine sediment, 5-30% (20-50% for low- gradient) of the bottom affected; slight deposition in pools.	new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom harging frequently; pools almost absent due to substantial sediment deposition.
	SCORE 🗸	20 19 18 17 16	15 14 13 12 11	10 9 (3) 7 6	5 4 3 2 1 0
	5. Charmel Flow Sixtur	both lower banks, and a minimal amount of	vailable channel; or	available channel, and/or c nifle substrates are	Very little water in charmel and mostly mesent as standing cools.
	score 7	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1 0

Γ	Habitat		Canditi	on Category	
	Parameier	Optimal	Subortimel	Marginal	Poor
	6. Channel Alternion	Channelination or dredging absent or minimal; stream with normal pattern.	Some channelization passers, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging (greater than past 20 yr) may be passers, but accent channelization is not passers.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks showed with gabion or cement; over 80% of the stream reach channelized and
	SCORE 18	20 (19) 18 17 16	6 15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
rany ling reach	7. Channel Somesty	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note charmed braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily raised in these areas.	increase the stream length 2 to 3 times	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Charmel straight; walniway has been charmelized for a long distance.
	SCORE 8	20 19 18 17 16	15 (4) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
evaluated broader than	2. Benk Subility (score each bank)	Banks stable; evidence of erosion or bank fainte absent or minimal; little potential for future problems. <5% or bank affected.	Moderately stable; inflequent, small areas of erosion mostly healed over. \$-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	
1	SCORE 9 (LB)	Left Bank 10 9	9 7 6	5 4 3	2 1 0
	SCORE 1 (RB)	Right Bark 10 9	0 7 6.	5 4 3] 2 1 0
Parameters to	9. Vegenative Protection (score each bank) Note: determine left or right side by facing downstream.	to grow raturally.	70-90% of the streambank surfaces covered by rative vegetation, but one class of plants is notwell-represented; disruption evident but not affecting full plant growth potential to any great extent, more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubb is height remaining.	Less than D% of the streambank surfaces covered by vegetation; disruption of streambank vegetations very high vegetation has been removed to 5 certification of the streambank s
	SCORE (LB)	Left Bank (19)	8 7 6	5 4 3	2 1 0
(SCORE 7 (RB)	Right Bank (D)	8 7 6	5 4 3	2 1 0
	10. Riparian Vegetative Zone Whith(scom each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., pairing lots, madbeds, clear-cuts, lawzs, or crops) have not imparted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian mre <6 meters: little or no riparian vegetation due to imman activities.
- 1	SCORE & (LB)	Left Bank 10 (9) Right Bank 10 (9)	8 7 6	5 4 3	2 l 0
- 1	SCORE $8/(RB)$				

STREAM NAME HOLE Brook	LOCATION	Wob	irn
STATION # SDO MVERMILE	STREAM CLASS		
LAT_SDIO LONG	RIVER BASIN		
STORET#	AGENCY		
INVESTIGATORS			
FORM COMPLETED BY	DATE	LW PW	REASON FOR SURVEY

	Habitat		Conditio	n Category	
	Parameer	Optimal	·· 5ukop timel	Marginal	Poor
	l. Epifamal Substrate/ Available Cover	Greater than SIV of substrate favorable for epifamal colorination and fish cover, mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage in allow full colorination potential (i.e., logs/snags that are not new fall and mit transient).	30-50% mix of stable habitat, well-suited for full colormation potential, adequate habitat for maintenance of populations; presente of additional substrate in the form of newfall, but not yet prepared for colormation (may rafe at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or rannoved.	Less than 10% stable habitat; lack of labitat is obvious; substrate unstable or lacking.
Ach Ach	5CORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	3) 4 3 2 1 0
Parameters to be evaluated in sampling reach	2 Poal Substrate Characterization	Mixtue of substate materials, with gravel and firms and prevalent, root made and submerged vegetation common.	Mixtue of soft sand, mud, or clay, and may be dominant, some mot mats and submerged regetation pursum.	All mid or clay or sand bottom; little or no root mat, no submerged regitation.	Hard-panciay or bedrock; no not mat or vegetation
3	SCORE	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1 0
be eraka	2 Poul Variability	Even mit of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
1 5	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 (LO)
Paramet	4 Sediment Deposition	Little or no enlargement of is lands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, s and or fine sediment, 5-30% (20-20% for low- gradient) of the bottom	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-31% (50-80% for low-gradient) of the bottom affected;	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently,
	b	•	affected; slight deposition in pook.	sediment deposits at obstructions, constructions, and bends; moderate deposition of pools prevalent.	pools almost absent due to substantial sediment deposition.
	5CORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Charmel Flow Starus	both lower banks, and minimal amount of		available channel, and/or rifle substrates are	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 (1)	10 9 8 7 6	5 4 3 2 1 0

Г	Habitat	Property and the second	Condition		
1	Paremeter		ļ	Marchal	<u> </u>
	6. Charmel Alteration	On time! Channelization or dredging absent or minimal, stream with normal pattern.	Suboptimal Some channelization passent, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be passent, but accent channelization is not	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Poor Barks shored with gabins or coment; over 80% of the stream reaci charmelized and disturbed. Instream habitat greatly altered or removed entirely.
	SCORE	20 19 18 17 (16		10 9 8 7 6	5 4 3 2 1 0
ling reach	7. Channel Simusity	The bends in the stream immease the stream length 3 to 4 times longer than if it was in a straight time. (Note charmel braiding is considered normal in coastal plains and other low-lying area. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Charmel straight; waterway has been charmetized for a long distance.
Chi Ma	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 (3) 2 1 0
he evaluated broader than sampling reach	8. Bank Subility (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future publishers. <5% of bank affected.	Moderately stable; infraquent, small areas of emision mostly healed over. 5-30% of bank in reach has areas of emision.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many emoded area; "any amend frequent along straight sections and bends; obvious bank slong-ing, 60-100% of bank has erosional scars.
12	SCORE (LB)	Left Sank 10 9	8 7 6	5 4 3	2 1 0
5	SCORE (RB)	Right Bank 10 9	8 7 6 -	5 4 3	2 1 0
Parameters to	2. Vecentive Protection (score each bank) Note: determine left or right side by ficing downstream.	More than 50% of the stream and surfaces and immediate inpurant inner covered by native vegetation, including trees, undertookly inaccipations; or nonwoody inaccipations; vegetative disruption timough graining or not evident, almost all plants allowed to grow naturally.	70-90% of the strambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than ore- half of the potential plant stubble height remaining.		Less than 50% of the streambank surfaces covered by regetation; disruption of streambank regetation is very high vegetation is seen nemoved to Scentimeters or less in average stupole height.
	SCORE (LB)	Left Bank 10	8 7 (6)	5 4 3	2 1 0
L	SCORE(RB)	Right Bank 10	8 7 6	5 4 3	2 1 0
	10. Riparian Vermative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., pairing lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	12-18 meters; lauman activities have impacted	12 meters; human activities have impacted	Width of riparian mre <6 meters: little or m riparian vegetarium due to lumnan activities.
L	~	<u></u>			
	SCORE \\(\frac{\frac{1}{\text{LB}}}{\text{LB}}\)	Left Bank 10 9	8 7 6	5 4 3	2 1 0 1

STREAM NAME Halls Brown	LOCATION			
STATION # SP-10 RIVERMILE	STREAM CLASS			
LATLONG	RIVER BASIN	RIVER BASIN		
STORET#	AGENCY			
INVESTIGATORS				
FORM COMPLETED BY BUT POSH'S	DATE AH PM	REASON FOR SURVEY		

	Habitat Parameter		Conditio	n Category	
	Parameter	Optimal	Subspiinel	Marginel	Poor
	1. Epifermal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifamal colorization and fish cover, aim of snaes, submerged logs, undercut banks, cobole or other stable habitat and at stage to allow full colorization potential (i.e., logs/snaes that are not new fall and not transient).	30-50% mix of stable habitat, well-suited for full colormation potential; dequate habitat for manuscance of populations; passence of additional substrate in the form of newfall, but not yet papared for colormation (may rate at high end of scale).	10-30% mix of stable habitat, habitat availability less than desirable; substrate finquently disturbed or removed.	Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.
1 45	score 7	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1 0
n empling n	2 Pool Substrace Characterization	Mixtum of substate materials, with gravel and firms and prevalent, root mate and submerged vegetation common.	Mixture of soft sand, mud, or clay, and may be dominant, some not man and submerged regetation present.	All mind or clay or sand bothers, little or no mot mat, no submerged vegstation.	Hard-panciay or bedrock; no not mat or vegetation
3	SCORE 10	20 19 18 17 16	15 14 13 12 (1)	10 9 8 7 6	5 4 3 2 1 8
be evalua	2 Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large deep; very few shallow.		Majority of pools small- shallow or pools absent
1 2	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8	5 4 3 2 1 0
Parameters to be evaluated in sampling roach	4 Sediment Depo <i>siti</i> on	of is lands or point bars and less than 1% <20% for low-gradient streams) of the bottom affected by sediment deposition.	bar formation, mostly from gravel, s and or fine sediment, \$-30% (20-30% for low-gradient) of the bottom affected; slight deposition in pools.	new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions,	Heavy deposits of fine material, immessed har development; more than 50% (80% for low-gradient) of the bottom charging frequently, pools almost absent due to substantial sediment deposition.
	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 🚱	5 4 3 2 1 0
	Sistema	both lower banks, and minimal amount of	available channel; or <25% of channel	available channel, and/or or nifle substrates are	Very little water in channel and mostly present as standing pools.
	SCORE 8	20 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0

Γ	Habitat Parameter		Conditi	on Category	
	FALUNCES	Optimal	Subortimal	Marginal	Poor
	6. Channel Alteration	Channelization or dradging absent or minimal; streamwith normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embandments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	80% of the stream reaction of the stream and
	SCORE 17	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
pling reach	7. Channel Sinuscity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a smagni time. (Note channel braiding is considered normal in coastal plains and other low-lying area. This painment is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Charmel straight; waterway has been charmelized for a long distance.
[score 3	20 19 18 17 16	15 14 13 (17) 11	10 9 8 7 6	5 4 3 2 1 0
to he evaluated broader than ranging reach	8. Bank Smbility (scare each bank)	Banks stable; evidence of erosion or dank falture absent or numeral; little potential for future produces. <5% of bank affected.	Moderately stable; infequent, small areas of erosion mostly leaded over. \$-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods	Unrable; many enderares; "any areas; "any areas frequent along straight sections and bends; obvious bank sinughing; 60-100% of bank has ensional scars.
4	SCORE (LB)	Left Bank 10 🚱	8 7 6	5 4 3	2 1 0
•	SCORE (RB)	Right Back 10 by	8 7 6 -	5 4 3	2 1 0
Parameters to l	9. Vegenative Protection (score each bank) Note: determine left or right side by firms downstream.	More than 50% of the spearing ark surfaces and immediate reparan more covered by native vegetation, including trees, understony shrubs, or norwoody macrophyres; vegetative disruption through graining or not evident, aimost all plants allowed to grow naturally.	70-90% of the steambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not attracting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	SO-70% of the steambank surfaces covered by vegetation; disruption obvious; patches of base soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than DN of the smeamh and surfaces covered by regetation; disruption of streamhank vegetation has been removed to 5 certifiers or less in average stubble neight.
	SCORE 1_(LB)	Left Bank 10	Q 7 6	5 4 3	2 1 0
	SCORE 1 (RB)	Right Bank 10	® 7 6	5 4 3	2 1 0
	10. Riparian Vezentive Zone Wilth (scom each bank nparian 2012)		Width of inparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian mrs 6- 12 meters; human activities have impacted mrs a great deal.	Width of riparian mre <6 meters: little or m riparian vegetation due to meman activities.
	SCORE 8_(LB)	Left Bank 10 🙆	8 7 6	5 4 3	2 1 0
- 1	SCORE 8 (RB)	Right Bank 10 🔗	8 7 6	5 4 3	2 1 0

STREAM NAME HBHA Porch 3	LOCATION				
STATION # SD - 11 RIVERMILE	STREAM CLASS				
LATLONG	RIVER BASIN				
STORET#	AGENCY				
INVESTIGATORS	INVESTIGATORS				
FORM COMPLETED BY	DATE AM PM	REASON FOR SURVEY			

	Habitat Parameter		Conditio	n C alegory	
	recones	Op timal	Suboptimal	Marginal	Poor
	1 Epiformal Substrate/ Available Cover	Greater than 20% of substrate favorable for epitamial colorization and fish cover, mix of snags, submerged logs, undercut banks, cobole or other stable habitat and at stage to allow full colorization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat, well-suited for full colonization poterital; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.
12	5CORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Paruneters to be evaluated in sampling reach	2 Poal Substrate Characterism	Mixtue of substate materials, with gravel and firms and prevalent, root mate and sub merged vegetation common.	Mixtus of soft sand, mid, or clay, mid may be dominant, some mot man and submerged regretation present.	All med or clay or sand bottom; little or no not mat; no submerged vegetation.	Hard-panciay or bedrock; no not mat or vegetation
3	SCORE-	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
o he evalua	1 Poul Variability NA	Even mix of large- shallow, large-deep, small-shallow, small- deep pools mesent	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent thandeep pools.	Majority of pools small- shallow or pools absent
5	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Partunglers	4 Sediment Deposition	of is lands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment, 5-30% for low-gradient) of the bottom affected; slight deposition in pools.	new gravel, sand or fine sediment on old and new bars; 31-31% (\$0.80% for low-gradient) of the bottom affected; sediment deposits at obstructions,	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently, pools almost absent due to substantial sediment deposition.
	5CORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Charmel Flow Startus	both lower banks, and minimal amount of	substrate is exposed.	available channel, and/or criffs substrates are	Very little water in charmel and mostly cose ent as standing cools.
	SCORE	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 0

Γ	Habitat		Conditi	on Category	
I	Parameter	Optimal	Subsptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization passers, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be passers, but accent channelization is not passers.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Barks showd with gabion or coment; over 80% of the stream reach channelized and distipled. Instream habitat greatly altered or removed entirely.
	SCORE	20 19 18 17 16	15 14 13 12/11	10 9 8 7 6	5 4 3 2 1 0
range ling reach	7. Channel Simulativ	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight lime. (Note - charmel braiding is considered mornal in coastal plans and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times ionger than if it was in a stranger lime.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Crammel straight; waterway has been charmelized for a long distance.
1	SCORE	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	S 4 3 2 1 0
Parameters to be evaluated broader than	2. Bank 5 mb ility (scare and bank)	Barits stable; evidence of erosion or bark faintre absent or minimal; little potential for future problems. <5% or bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. \$-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable; many emded area; "aw" area fraquent along straight sections and bends; obvious bank slong aing; 60-100% of bank has erosional scars.
1	SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
5	SCORE(RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Patrameters to	9. Vegenative Protection (score each bank) Note: determine left or right side by factor downstream	Mose than SU% of the meanth aris surfaces and immediate inparian time covered by native vegetation, including trees, understony samps, or nonwoody macophyles; vegetative disruption through training or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streams and surfaces covered by native vegetation, but one class of plants is not well-represented, disruption eviders but not affecting full plant growth potential to any great extent, more than one-half of the potential plant stubble height remaining.	50-70% of the steambank surfaces covered by vegetation; disruption obvious; patches of base soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 90% of the streambank sturfaces covered by vegetations; disruption of streambank vegetations very high vegetation has been removed to 5 comments or less in avenue stumble hears.
	(EI)	Left Bank 10	B (j) 6	5 4 3	2 l 0
	SCORE(RB)	Right Bank 10	8 (1) 6	5 4 3	2 1 0
	III. Riparian Vegendive Zone Whith (senn each bank aparian zone)	activities (i.e., parking	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	activities have impacted	Width of riparian mre <6 meters: little or m imparian vegetation due to imman activities.
1	\ ' ` '	Left Bank 10 9	8 7 6	5 (4) 3	2 1 0
L	SCORE(RB)	Right Bank 10 9	8 7 6	5 (4) 3	2 1 0

Total Score	
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STREAM NAME POND3	LOCATION
STATION # SDI RIVERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET#	AGENCY
INVESTIGATORS	
FORM COMPLETED BY	DATE AM PM REASON FOR SURVEY

	Habitat Condition Category Parameter				
	Pataneer	Optimal	Suboptimal	Marginel	Poor
	1. Epiformal Substrate/ Available Cover	Greater than 30% of substrate favorable for epifarmal colonization and fish cover, mix of stags, submerged logs, undernut banks, cobble or other stable habitat and at stage to allow full colonization posential (i.e., logs/snags that are not new fall and and transient).	30-50% mix of stable habitat, well-suited for full colormation potential; adequate nabitat for mannenance of populations; presente of additional substame in the form of newfall, but not yet prepared for colormation (may rate at high end of scale).	10-30% mix of stable habitat, habitat habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 (12)11	10 9 8 7 6	5 4 3 2 1 0
to be exhated in ampling reach	2 Pool Substrate Characterization	Mixtue of substate materials, with gravel and firms and prevalent, root mate and submerged vegetation common.	Mixture of soft sand, mad, or clay, and may be dominant, some not man and submerged vegetation passent.	All med or clay or sand bottom; little or no root mat, no submerged vegetation.	Hard-panciay or bedrock; no not mat or vegatation.
3	SCORE \	20 19 18 17 16	15 14 13 12 11	10 9 8 (7) 6	5 4 3 2 1 0
o be eraha	3 Pool Variability		Majority of pools large- deep; very few shallow.		Majority of pools small- shallow or pools absent
La	SCORE PIR	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameter	4 Sediment Deposition	of is lands or point bars and less than 5% <20% for low-gradient stmams) of the bottom affected by sediment deposition.	bar formation, mostly from gravel, s and or fine sediment. 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	new gravel, sand or fine sediment on old and new bars; 30–30% (50-80% for low-gradiem) of the bottom affected; sediment deposits at obstructions,	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom hanging frequently, pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 (2) 1 0
	5. Charmel Flow Starter	both lower banks, and minimal amount of	available channel; or <25% of channel	available channel, and/or or nille substrates are mostly exposed.	Very little water in charmel and mostly ones ent as standing cools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

٢	Habitat		Combine	n Carleny	
Ţ	Parameer	Ontimal	Subortimal	Marginal	Poor
	6. Channel Alteration	Channelization or dradging absent or minimal; stream with normal pattern.	Some channelization passent, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging (greater than past 20 yr) may be pasent, but accent channelization is not passent.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks showed with gabion or comerc; over 80% of the stream reach channelized, and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE	20 19 18 17 16	5 15 14 13 12 11	10 9 8 (7) 6	5 4 3 2 1 0
rangling reach	7. Channel Speedity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note-charme) braiding is considered normal in coastal planes and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to I times longer than if it was in a straight line.	Charmel straight; waterway has been charmelmed for a long distance.
E .	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	3)4 3 2 1 0
to be evaluated broader than	2. Bank 5 mbility (score each bank)	Barics stable; evidence of erosion or bank fainne absent or minimal; little potential for future publishers. <5% or bank affected.	Moderately stable; infraquent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable; many eroded area; "new" areas frequent along straight sections and bends; obvious bank slong into, 60-100% of bank has erosional scars.
1	SCORE(LB)	Left Bank 10 /9	8 7 6	5. 4 3	2 1 0
90	SCORE(RB)	Right Bank 10 9	8 7 6 -	5 4 3	2 1 0
Parameters to	9. Vectorive Protection (score each bank) Note: determine left or right side by facing downstream.	armost all plants allowed	regetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one- half of the potential plant stubble height represent.	stmannianic surfaces, a covered by regetation; disruption obvious; painties of base soil or ciosely cropped	Less than 50% of the streambank numbers covered by vegetation; disruption of streambank vegetation is very him; vegetation has been removed to 5 comments or less in average stubble height.
ĺ	SCORE(LB)	Left Bank 10	/ 8 7 6	5 4 73	2 1 0
Į	SCORE(RB)	Right Bank 10	8 7 6	5 4 3	2 1 0
	10. Riparian Vegenative Zone Whith (scome each bank riparian zone)	>18 meters; human activities (i.e., pairing	12-18 meters; human activities have impacted	12 meters; human activities have impacted	Width of riparian more <6 meters: little or m riparian vegetation due to imman activities.
- 1	SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	/ 2 / 1 0
- 1	SCORE (RB)	Right Bark 10 9	8 7 6	5 4 3	2 1 0

STREAM NAME HE. P.S. Breck	LOCATION	***
STATION JO-/ L RIVERMILE	STREAM CLASS	
LATLONG	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY Cherlie Menzie	DATE AM PM	REASON FOR SURVEY

Habitat	Category				
Parameter	Optimal	Suboptimal	Marginal	Poor	
I. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifamal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new full and not transient).	30-50% mix of stable habitat; well-suited for full culonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfalt, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lucking.	
SCORE	20 19 12 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1 9	
2.Fool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mad or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedroe; no root dust or vegetation.	
SCORE	20 19 18 17 16	15 (14)13 12 11	10 9 8 7 6	5 4 3 2 10	
3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools sixuli- shallow or pools absent.	
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 E 0	
4. Chennel Alteration		Some channelization present, usually in areas of bridge abutments; evidence of past 'annelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks stored with gabion or coment; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
SCORE	20 (19) 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 l D	
5. Sediment Deposition	the bottom affected by sediment deposition.	sediment; 5-30% (20-50% for low- gradient) of the bottom affected; slight deposition in pools.	new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends;	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
CORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	

Habitat	Category				
Parameter	Optimal	Suboptimal	Marginal	Poor	
6. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.		
SCORE	20 19 18 17 16	15 (14)/13 12 11	10 9 8 7 6	5 4 3 2 1	
7. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
SCORE	20 .19 (18) 17 16.	15 14: 13 12 11	10 9 8 7 6	5 4 3 2 1 6	
8. Bank Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces covered by native vegetation, including trees, understory strubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the surcambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	\$0-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed so 5 centimeters of less in average stubble height.	
SCORE(LB)	Left Bank 10 (9	8 7 6	5 4 3	2 1 6	
SCORE (RB) 9. Bank Stability (score each bank)	potential for fixture	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many croded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has crosional sears.	
SCORE (LB)	Left Bank 10 (9)	8 7 6	5 4 3	2 1 0	
SCORE(RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0	
ió. Riparian Vegetative Zonc Width (score each sank riparian 2000)	>18 meters; buman activities (i.e., parking	activities have impacted	Width of riperian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.	
CORE(LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0	
CORE (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 6	

Total	Score	•
TATE	2010	

STREAM NAME HELL	5 Brook	LOCATION		**	
STATION # SDIZ RIV	ERMILE	STREAM CLASS	;		
LATLON	G	RIVER BASIN			
STORET #	•	AGENCY			
INVESTIGATORS					
FORM COMPLETED BY	K-18	DATE 6-1749	1430 M	REASON FOR SURVEY	

Habitat		Category				
Parameter	Optimal	Suboptimal	Marginal	Poor		
i. Epifsunal Substrate/ Available Cover	Greater than 50% of substrate favorable for pifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not me, logs/snags that are not me, logs/snags transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-10% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 19% stable habitat; lack of habitat is obvious; substrate unstable or lacking.		
SCORE ()	20 19 18 17 16	15 14 13 12 11	10 9 4 7 6	5 4 3 2 1 0		
Application Light Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedroc.; no root mat or vegetation.		
SCORE ()	20 19 18 17 16	15 14 13 12 11	10 0 8 7 6	5 4 3 2 1 0		
3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Skallow pools much more prevalent than deep pools,	Majority of pools small- shallow or pools absent.		
SCORE	20 19 IB 17 I6	15 14 13 12 11	10 9 8 7 6	5 4 3 4 9		
4. Channel Alteration	Channelization or dredging absent or ministral; stream with normal patzern.	Some channelization present, usually in areas of bridge abutments; evidence of past hannelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures; present on both banks; and 40 to \$0% of stream reach channelized and disrupted.	Banks shored with gabion or coment; over 80% of the gream reach charactized and disrupted. Instrume habitat greatly altered or removed entirely.		
SCORE	19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0		
S. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	new gravel, sand or fine sediment on old and new bars; 10-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions,	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.		
`	20 18/17 16		pools prevalent.	deposition.		

Habitat	' Category				
Parameter	Optimal	Suboptimal	Marginal	Poor	
6. Channel Sinussity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	-	
SCORE JU	rated in these areas. 20 19 18 17 16	15 🗥 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
7. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
SCORE 17	1 19 (15) 17 16.	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
8. Bank Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters by less in average stubble height.	
SCORE (LB)	Left Bank 10 (9)	8 7 6	5 4 3	2 1 0	
SCORE (RB) 9. Bank Stability (score each bank)	absent or minimal; little potential for future	Moderately stable; infrequent, small areas of erosion mostly healed over, 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	2 I. 0. Unstable; many croded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has crosional sears.	
SCORE (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0	
COREL (RB)	Right Bank 110 9	8 7 6	5 4 3	2 1 0	
10. Riparian Vegetative Zone Width (score each sank riparian zone)	>18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not	Width of riparian zone 12- tB meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: tittle or no riparian vegetation due to human activities.	
CORE (LB)	Left Bank 10	8 7 6	5 4 3	2 1 0	
CORE (RB)	Right Bank 10 🚺	8 7 6	5 4 3	2 1 C. [

Total Score	 _		
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	7 A	\$ we	

District State

STREAM NAME SDIZ	LOCATION Hall'S. Brock
STATION #RIVERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS	
FORM COMPLETED BY PLH TYLCK	DATE 6-17-99 . REASON FOR SURVEY
	14.3/1

Habitat				
ParaMeter	Optimal	Suboptimal	Marginal	Poor
I. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are 101 new fall and 001 transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat, habitat availability less than desirable; substrate frequently disturbed or removed.	obvious; substrate unstable or lacking.
SCORE	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2,960i Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mass and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-past city or bedroc no root mat or vegetation.
SCORE	20. 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Poet Variability	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 (3)2 1:0
4. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past namelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 10% of stream reach channelized and disrupted.	Banks shored with gabion or coment; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 (19)18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	new gravet, sand or fine	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14/13/12 11	10 9 8 7 6	5 4 3 2 1 0

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Habitat		Category			
Parameter	Optimal	Suboptimal	Marginal	Poor	
6. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas: This parameter is not easily	it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times tonger than if it was in a straight line.		
SCORE	rated in these areas. 20 19 18 17 16	(5) 14 13 12 11	10 9 2 7 6	5 4 3 2 1 (
7. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel: or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
SCORE 1	20 19 18 17 16	(15 / 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
8. Bank Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation has been removed to 5 centimeters or less in average stubble height.	
SCORE(LB)	Left Bank 10 9	8 (7) 6	5 4 3	2 1 0	
SCORE (RB) 9. Bank Stability (score each bank)	Right Bank 10 9 Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	5 4 3 Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many croded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has crosional scars.	
SCORE (LB)	Left Bank 10 /9	8 7 6	5 4 3	2 1 0	
SCORE (RB)	Right Bank 10 😏	8 7 6	5 4 3	2 1 0	
to. Riparian Vegetutive Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawas, or crops) have not impacted zone.	Width of riparian zone 12- 18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of rigarian zone <6 meters: little or no riparian vegetation due to human activities.	
SCORE (LB)	Left Bank 10 (9)	8 7 6	5 4 3	2 1 0	
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0.	

Total	Score	-	

HARITAT ASSESSMENT FIELD DATA SHEFT...I.OW CDADIENT STREAMS (BACK)

STREAMNAME Hall Brook	LOCATION #4.
STATION # 5D-12 RIVERMILE	STREAM CLASS
LAT LONG	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS	
Bart Hoskins	DATE G-17- 99 AM (F) REASON FOR SURVEY

Habitat	T	Category			
Parameter	Optimal	Suboptimal	Marginal	Pour	
1. Epifaunal Substrato Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snagx, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not translent).	adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
SCORE 13 29 to 15 Substrate Characterization	20 19 18 17 16 Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	15 14 (3) 12 11 Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All, mud or clay or sand bottom; little or no root mat; no submerged vegetation.	5 4 3 2 L 0 Hard-pan city or bedroc; no root mat or vegetation.	
SCORE /O	20 19 18 17 16	15 14 13 12 11	10 (9) 8 7 6	5 4 3 2 1 0	
J. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	prevalent than deep pools.	Majority of pools small- shallow or pools absent.	
SCORE S	20 19 18 17 16	15 14 13 12 11	10 9 1 7 6	(5) 4 3 2 E 0	
4. Cleanach Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	present, usually in meas of bridge abutments; evidence of past hannelization, i.e.,	extensive; embandments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
SCORE 19	20 (19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
S. Sediment Deposition SCORE	Little or no enlargement of islands or point bars and less than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in poofs.	new gravel, sand or fine sediment on old and new bars; 10-30% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends;	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	

Habitat	· Calegory			
Parameter	Optimal	Suboptimat	Marginai	Poor
6. Channel Sinuesity	The bends in the stream increase the stream length. I to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	1	
SCORE 14	20 19 18 17 16	15 14 13 (12) 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 🎉	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6.	5 4 3 2 1 0
8. Bank Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces covered by native vegetation, including trees, understory shrubs, or nonwoody unacrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 8 (LB) SCORE 8 (RB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
9. Bank Stability (score each bank)	affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable; many croded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has crosional scars.
SCORE 7 (LB) SCORE 7 (RB)	Left Bank 10 (9)	- 8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each cank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking	Width of riperian zone 12- 18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
CORE 10 (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
CORE 10 (RB)	Right Bank (10 9	8 7 6	5 4 3	2 1 0

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Total	Score	

STREAM HAME Aberyona	LOCATION Waburn		
STATION #503_RIVERNILE	STREAM CLASS		
LATLONG	RIVER BASIN		
STORET#	AGENCY		
INVESTIGATORS			
FORM COMPLETED BY	DATE REASON FOR SURVEY		

Habitat Condition Category Parameter					
	- Falsace:	Optimal	Suboptimal	Marginal	Prox
	1 Epifamal Substrate/ Available Cover	Greater than 31% of substrate favorable for epifamal colomization and fish cover; mix of snags, nomerged logs, underent banks, cobble or other stable habitat and at stage to allow full colomization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat well-suited for full colonization potential; adequate habitat for manuscance of populations; passence of additional substant in the form of newfall, but not yet papared for colonization (may rate at high end of scale).		Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.
1	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
to be evaluated in sampling reach	2. Pool Substrate Characterization	Mintum of substrate materials, with gravel and firms and prevalent, not man and submerged vegetation common.	Mixture of soft sand, mud, or clay, and may be dominant, some not may and submerged vegetation present.	All mad or clay or sand bottom; little or no mot mat, no submerged vegetation.	Hard-panciay or bedrock; no not mat or vegetation
3	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
be evalue	3. Poel Veriebility	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
5	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameters	4 Sediment Deposition	and less than 5% < 20% for low-gradient streams) of the bottom affected by	Some new increase in bar formation, mostly from gravel, s and or fine sediment, S-30% (20-30% for low-gradient) of the bottom affected; s light deposition in pook.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom afficied; sediment deposits at obstructions, constructions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development, more than 50% (80% for low-gradient) of the bottom changing frequently, pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Charmel Flow Status	both lower banks, and minimal amount of	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	available channel, and/or nille substrates are	Very little water in channel and mostly passent as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Γ	napmu	Condition Category				
	Parameier	Optimal	Subsptimal	Markinal	Poor	
	6. Channel Alteration	Channelization or diredging absent or minimal; stream with normal pattern.	Some channelization passeri, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging (greater than past 20 yr) may be passeri, but accent channelization is not passeri.	Channelization may be extensive; embandments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	80% of the stream reach charmelized and	
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
line mach	7. Channel Smearig	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note charmed braiding is considered normal in coastal plants and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Charmel straight; waterway has been charmelized for a long distance.	
2	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
Parameters to be evaluated broader than someling reach	& Benk Smbility (scure each bank)	Hanks stable; evidence of erosion or bank failure absent or minimal; little potestial for future publishes. <5% or bank affected.	Moderately stable; inflequent, small areas of erosion mostly healed over. S-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable; many emded area; "aw" area frequent along straight sections and bends; obvious bank situgin 60-100% of bank has erosional scars.	
1 =	SCORE(LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0	
	SCORE(RB)	Right Bank 10 9	8 7 6 -	5 4 3	2 1 0	
Parsoneters to	9. Vegrative Protection (score each bank) Note: determine left or right side by facing downstream	Mose than 90% of the streambark surfaces and immediate inparian more covered by native vegetation, including trees, undersony simulas, or norwoody macophysis; vegetative disraption trong or moving minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the steambank smaces covered by vegetation; disruption obvious; patches of base soil or closely cropped vegetation common; less than one-half of the potential plant stubb is height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation has been removed to 5 certified or less in average stubble negit.	
	SCORE(L3)	Left Bank 10	8 7 6	5 4 3	2 ì O	
	SCORE(RB)	Right Bank 10	8 7 6	5 4 3	2 1 0	
	10. Riparism Vegetative Zone Width(score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lob, roaibeds, clear-cuts, lawas, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meter; luman activities have impacted zone a great deal.	Width of riparian mre <6 meters: little or no mpanan vegetarion due to imman activities.	
ļ	SCORE(LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0	
	SCORE(RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0	

LOCATION	51.	
STREAM CLASS		
RIVER BASIN		
AGENCY		
18/18/19 (M) PM	REASON FOR SURVEY	
	STREAM CLASS RIVER BASIN AGENCY	STREAM CLASS RIVER BASIN AGENCY

4.45

Habitat	Category Category					
Parameter	Optimal	Suboptimal	Marginal	Poor		
I. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifatunal colonization and fish cover; mix of snagx, submerged logs, undercut banks, cobbide or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not trensient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.		
2.Pool Substrate Characterization SCORE	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common. 20 19 18 17 16	Mixture of soft sand, mud, or clay; and may be dominant; some root mass and submerged vegetation present. 15 14 13 (2) 11	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedroc- no root mat or vegetation.		
1. Peet Variability 2 SCORE	Even mix of large- station, large-deep, smail-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.		
4. Channel Alteration	Chancelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; vidence of past hamselization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.		
SCORE	20 19 18 17 16	15 14 13 12 12	10 8 7 6	5 4 3 2 1 0		
5. Sediment Deposition	Little or no enlargement of islands or point bars and iess than 5% <20% for low-gradient streams) of the bottom affected by sediment deposition.	formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low- gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.		
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 7%	5 4 6) 2 1 0		

Habitat	Calegory						
Parsmeter	Optimai	Suboptimal	Marginal	Poor			
6. Chaunel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.					
A	(Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.						
SCORE	20 19 18 17 16	15 -14 13 12 11	10 9 (1) / 6	5 4 3 2 1 0			
7. Channel Flow Status	Water reaches base of both tower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.			
SCORE	20 19 18 17 16.	15 14/\\X\\12 11	10 9 8 7 6	5 4 3 2 1 0			
8. Bank Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely exopped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.			
SCORE (LB)	Left Bank 10	7 6	5 4 3	2 1 0			
SCORE (RB) 9. Bank Stubility (score each bank)	absent or minimal; little potential for future	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of crosion.	Moderately unstable; 30- 60% of bank in reach has areas of crosion; high crosion potential during floods.	Unstable; many croded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has crosional scars.			
CORED_(LB)	Left Bank 10 9	7 6	5 4 3	2 1 0			
CORRY (RB)	Right Bank 10 9	7 6	5 4 3	2 1 0			
6. Riparian /egetative Zone Vidth (score each ank riparian zone)	>18 meters; human activities (i.e., parking	Width of riparian zone 12- 18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters, human activities have impacted zone a great deal.	Width of riperian zone <6 meters: little or no riperian vegetation due to human activities.			
CORE (LB)	Left Bank 10 9	7 6	5 4 3	2 1 0			
COREY (RB)	Right Hank 10 9	8 7 6	5 4 3	2 1 0			

		-
Tatal	Score	
1 41-1	GLUIC	

Appendix B Data Usability Reports

Data Usability Review

Metals Analyses

by EPA Methods 6010B (ICP), 7470A (CVAA), and 7000 series (GFAA) EPA Region I Tier III - type review

Client:

Menzie-Cura & Associates, Inc.

Site:

Industri-Plex, Woburn, Massachusetts

Laboratory:

Woods Hole Group Environmental Laboratory, Raynham, MA

SDG:

Lab ETR #s: 42547, 42551, 42574 and 42575

of samples/Analyses:

17 surface water samples for project-specific list of 19 total metals 17 surface water samples for project-specific list of 19 dissolved metals

2 rinsate blanks for total metals (associated with sediments)

Initial Reviewer: Susan D. Chapnick, New Environmental Horizons, Inc.

Senior Reviewer: Dr. Nancy Rothman, New Environmental Horizons, Inc.

Date Completed: December 15, 1999

The Data Usability Review, representing a Region I Tier III-type validation, was performed on the data package. The intentions of this review are:

- To determine if the data were generated and reported in accordance with the following:
 - EPA SW-846 Methods 6010B for ICP, 7471A for CVAA, and 7000 series for GFAA;
 - Toxicological Surface Water and Sediment Sampling and Fish Sampling Work Plan and Quality Assurance Project Plan for Industri-Plex Site, Woburn, Massachusetts, July 1999;
 - Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, 12/96;
 - Region I Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses, February 1989.
- 2. To determine if the data met the program data quality objectives for acceptable accuracy, precision, and sensitivity.
- 3. To determine and define the technical usability of the data based on the accuracy, precision, and sensitivity QA/QC indicators defined in the site QAPP.
- 4. To update the project database with appropriate data quality qualifiers.

The Data Usability Review consists of five sections. Section I is the Overall Summary of Data Usability including subsections addressing technical usability, accuracy, precision, representativeness, and sensitivity of the data. Sections II through V are hand-completed checklists: Section II - Data Package Completeness Review; Section III - Review of the Laboratory Data Summary Forms and Additional QA/QC Parameters; Section IV - Review of Overall Data Package Compliance; and Section V - Example Sample Calculations.

Jallagonick 7-c. RM

C. Technical Issues Affecting Precision and Representativeness - continued

Matrix duplicate precision could not be evaluated for 14 non-detected metals in the dissolved metals results including: aluminum, antimony, beryllium, cadmium, chromium, cobalt, copper, mercury, nickel, selenium, silver, thallium, vanadium, and zinc.

One field duplicate pair was included for each of the total and dissolved metals surface water samples: SD-02 and SD-02DUP. Field duplicate precision criteria were met for all detected total metals results and for all detected dissolved metals results with the exception of dissolved iron. The RPD for dissolved iron in the field duplicate pair was 121%. The two dissolved iron results in the field duplicate pair for dissolved metals were estimated (J) due to the observed imprecision. Evidence of poor precision in field duplicate results is an indication of heterogeneity. This may affect the representativeness of the dissolved iron results to the site location.

Field duplicate precision could not be evaluated for non-detected results in the total and dissolved metals surface water samples. Therefore, field duplicate precision could not be evaluated for 11 total metals results (antimony, beryllium, cadmium, chromium, cobalt, copper, mercury, selenium, silver, thallium, zinc) and 16 dissolved metals results (aluminum, antimony, arsenic, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, selenium, silver, thallium, vanadium, zinc).

D. Technical Issues Affecting Sensitivity

Blank contamination in method blanks, field rinsate blanks, and initial and continuing calibration blanks, along with an evaluation of the laboratory MDLs were reviewed to assess sensitivity of the results compared to QAPP-required reporting limits.

Sensitivity was acceptable for all surface water sample results compared to the project-specific reporting limits defined in Table 1-7 of the site QAPP (July 1999). Though all sample reporting limits met project requirements, low-level contamination of several metals was observed in the associated laboratory blank results for several total metals: aluminum, mercury, and zinc. Several total metals results for aluminum, mercury, and zinc that were less than the project reporting level and less than the blank action level were negated (qualified U) at the level found in the sample based on blank actions as follows:

- aluminum (total): SD-05DEEP, SD-06, SD-07DEEP, SD-07SHALLOW
- mercury (total): SD-01, SD-03DEEP, SD-07DEEP
- zinc (total): SD-03, SD-04

F. Summary of Completeness, Documentation, and Chain-of-Custody Issues

Chain-of-custody (COC) documentation of temperature on receipt at the laboratory was missing for several COCs. For samples received 6/21/99, a receipt temperature of 7° C was recorded. This exceeds the criterion of 4 ± 2 °C. The samples were collected in the summer and immediately sent via courier to the laboratory. Only surface water samples were collected associated with this COC. It appears that they did not have a chance to cool-down completely by the time they were received at the laboratory. No action was taken other than to note this discrepancy.

Indication of "sediment" or "surface water" for the association of the five-rinsate blanks was not made on the chain-of-custodies. However, personal communication with the sampler, Peter Kane of Woods Hole Group Environmental Laboratory, confirmed that the rinsate blanks were taken as rinses of the Eckman grab samplers used for sediment collection.

Times of sampling were not recorded on the chain-of-custody's for the sampling done on June 21 through June 23, 1999.

Sample aliquots for dissolved metals were filtered in the laboratory within 24 hours of collection except for samples SD-01, SD-02DUP, SD-08, SD-09, and SD-10 which were filtered within three to four days of collection. Samples were preserved immediately after filtration. Samples were maintained at 4 ± 2 °C.

NEH generated a data summary table based on the project data file supplied by the laboratory including the corrections and qualifications added to the data based on this Data Usability Review. The data summary table of technically valid and usable results for sediments reviewed by NEH is attached to this report.

Sample Location ID:		SD-04			SD-12		
Lab Sample ID:		42547-1			42547-3		
Date Sampled:	DV	06/17/1999	Lab	DV	06/17/1999	Lab	DV
Units	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.
Analyte - Metals (Total)							
EPA Methods 6010B and 7000 series							
Aluminum, Total		102			202		
Antimony, Total	UJ [low]	18.3	U	UJ [low]	18.3	U	UJ (low)
Arsenic, Total	J [high]	1.1	BN	J [high]	1.8	BN	J [high]
Barium, Total	-	28			29.8		1
Beryllium, Total	U	0.22	U	U	0.22	U	U
Cadmium, Total	U	0.78	U	U	0.78	U	U
Calcium, Total		26300			25800	-	
Chromium, Total	J	9	υ	υ	9	U	U
Cobalt, Total	J	3	U	U	3	Ų	U
Copper, Total	J	2.6		J	1.7	В	J
Iron, Total		1070			1110		
Lead, Total	J	4		J	5.6		
Magnesium, Total		4910			4710		
Manganese, Total		250	Ĭ		210		
Mercury, Total	U	0.04	U	U	0.04	U	U
Nickel, Total	J	1.3	В	J	1.2	Ų	U
Selenium, Total	U	1.6	В	j	1.1	u	U
Silver, Total	U	0.78	U	U	0.78	U	U
Thallium, Total	U	1.2	U	U	1.2	U	U
Vanadium, Total	J	2.6	U	U	2.6	U	U
Zinc, Total	B [high]	9	В	U	21.1		B [high]

Industri-Plex, V. Jurn, MA
Site Locations - Total Metals Surface Water Data

Validated 12/09/99; Revised 03/02/00 NEH, Inc.

Sample Location ID:	SD-08			SD-09	ļ		SD-10			SD-11		T	SD-13		
Lab Sample ID:	42575-1			42575-2	-		42574-4		 	42574-5	-		42547-4		
Date Sampled:	06/23/1999	Lab	DV	06/23/1999	Lab	DV	06/22/1999	Lab	DV	06/22/1999	Lab	lov —	06/17/1999	Lab	lov
Units	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L		Qual.	ug/L		Qual.	ug/L	Qual.	Qual.
Analyte - Metals (Total)			[Bias]			[Bias]		_	[Bias])	[Bias]	-9-	O(cons).	[Bias]
EPA Methods 6010B and 7000 series						· ·		_	1			[Disas]	 		[[Digg]
Aluminum, Total	176			200			111		 	84.8		B [high]	62.2		B [high]
Antimony, Total	18.3	U	UJ [low]	18.3	U	UJ flow]	18,3		UJ (low)	1.3		UJ (low)	18.3		UJ [low]
Arsenic, Total	29.2	N	J [high]	44.8	N	J [high]			J [high]	23.3	+	J (high)			J (high)
Barium, Total	31.3			34.9	 	1	29.5		1 1 3 1 1	31.3		13	43.4	_	(1491)
Beryllium, Total	0.22	U	Ų	0.22	Ų	U	0.22	U	u	0.22	+	tu	0.22		u
Cadmium, Total	0.78	U	U	0.78	Ū	U	0.7B		U	0.78	+	Tu	0.78		l <u>u</u>
Calcium, Total	63600			61700		<u> </u>	60900		<u> </u>	60700	;	ļ*—	52400		 -
Chromium, Total	9	Ų	U	10		J	9	U	u		ļu —	Ü	10.6		
Cobalt, Total	3	u	u	3	U	v	3	U	u		โม	Ü	1	U	lu -
Copper, Total	9.6			11.9			5.7		J	3.6	-	li -	2.6		1,
Iron, Total	1880		Ī	3650		1	2090		1	1930	+	 	2710	4	
Lead, Total	3.2		J	4.6		J	1.9		J	1.1		.1	1.4	+	
Magnesium, Total	8640			8570		ļ	8400	 	<u> </u>	8460		<u> </u>	8600		
Manganese, Total	593			707	 		578		·	696		 	749		 -
Mercury, Total	0.04	Ų	U	0.04	U	Ų	0.04		lu –	0.04		lu	0.04		
Nickel, Total	2.B	В	J	3	В	J	2.6		j -	2.5	, _	[2.7	-	 - -
Selenium, Total	1.1	u	u	1.1	U	U	1.1		u	1.1		U	1.1	-	Ϊ́υ
Silver, Total	0.78	Ų	U	0.78	U	U	0.78	U	Ū	0.78		lu	0.78		u
Thallium, Total	1.2	U	U	1.2		u	1.2		u	1.2		lu -	1.2		U
Vanadium, Total	5.1	8	J	5.9	8	J	3.6	-		5.4		 _	5.4	_	
Zinc. Total	332			192			102		<u> </u>	76.3		 	38.5		B (high)

Sample Location ID:	SD-04			SD-12		
Lab Sample ID:	42547-1			42547-3		
Date Sampled:	06/17/1999	Lab	DV	06/17/1999	Lab	DV
Units	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.
Analyte - Metals (Dissolved)						
EPA Methods 6010B and 7000 series						
Aluminum, Dissolved	50	U	υ	50	U	U
Antimony, Dissolved	100	U	U	100	บ	U
Arsenic, Dissolved	2	U	U	2	U	U
Barium, Dissolved	24			24		T
Beryllium, Dissolved	4	U	U	4	U	U
Cadmium, Dissolved	1	υ	U	1	U	U
Calcium, Dissolved	26000			26000	r	1 -
Chromium, Dissolved	10	U	U	10	U	U
Cobalt, Dissolved	3	U	U	3	U	U
Copper, Dissolved	2	U	U	2	U	U
Iron, Dissolved	310			240		1
Lead, Dissolved	1	U	U	1		J
Magnesium, Dissolved	4900			4700		T
Manganese, Dissolved	220			190		
Mercury, Dissolved	0.2	U	U	0.2	U	U
Nickel, Dissolved	2	U	U	2	U	U
Selenium, Dissolved	2	U	U	2	U	U
Silver, Dissolved	2	U	U	2	IJ	U
Thallium, Dissolved	2	U	U	2	U	U
Vanadium, Dissolved	10	U	U	10	U	u
Zinc, Dissolved	10	U	U	10	IJ	U

Sample Location ID:	SD-08		Ţ	SD-09	<u> </u>		SD-10			SD-11		T**	SD-13		
Lab Sample ID:	42575-1			42575-2		<u> </u>	42574-4	,	 	42574-5		†	42547-4		
Date Sampled:	06/23/1999	Lab	DV	06/23/1999	Lab	ΟV	06/22/1999	Lab	OΛ	06/22/1999	Lab	DV	06/17/1999	Lab	ΟV
Units	ug/L	Qual.	Quel.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual
Analyte - Metals (Dissolved)								-							
EPA Methods 6010B and 7000 series		i _													
Aluminum, Dissolved	50	Ų	U	50	U	U	50	U	U	50	u	U	50	IJ	u
Antimony, Dissolved	100	U	U	100	U	U	100	U	U	100	U	U	100		u I
Arsenic, Dissolved	6			15	!		5			- 6		 	5		Ť
Barium, Dissolved	27			32		1	28			28	<u> </u>		38		<u> </u>
Beryllium, Dissolved	4	U	U	4	U	U	4	Ų	U	1	U	U	4	U	u
Cadmium, Dissolved	1	U	Ų	1	U	U	1	U	υ		U	U	 	<u>-</u>	u
Calcium, Dissolved	79000			B0000	i		83000	 		79000		<u> </u>	54000		<u> </u>
Chromium, Dissolved	10	U	υ	10	U	v	10	U	U	10		U	10		Ш
Cobalt, Dissolved	3	U	U	3	U	U		U	U	3	U	U	 	U	u -
Copper, Dissolved	4		J	4		j	3		J	2		J	· — —	U	u
Iron, Dissolved	160	Ī		1000		1	200			210			230	_	
Lead, Dissolved	1	u	U	1	U	U	1	ับ -	ψ	1	U	U	··-	u	u
Magnesium, Dissolved	8600			8500		<u> </u>	8400			8500		T	8800	<u> </u>	╌
Manganese, Dissolved	560			670		1	530		T	690			770		
Mercury, Dissolved	0.2	U	U	0.2	U	U	0.2	Ų	U	0.2	U	U	0.2		u
Nickel, Dissolved	2	U	U	2	U	U	2	U	u		u	Ü	1 -	บ	U U
Selenium, Dissolved	2	U	U	2	U	Ų	2	U	U	2	u	U		Ū	U
Silver, Dissolved	2	U	U	2	Ū	U	2	U	U	2	U	u		U -	lu -
Thallium, Dissolved	2	U	U	2	Ü	Ų	2	U	U	2	U	U	 	U	lu
Vanadium, Dissolved	10	IJ	ū	10	U	u	10	U	υ	10	Ü	U	10		lu
Zinc, Dissolved	260	Ï		100	1		62	<u> </u>	T	42		 -	21	-	

III. Review of CLP-Like Summary Forms and Additional QA/QC Parameters

A. Holding Times/Preservation Criteria

1. Were holding times/preservation criteria met for all samples/analyses as indicated below? Yes

Metals

180 days from date of collection, preserved to pH < 2 and 4°C

Mercury

28 days from date of collection, preserved to pH < 2 and 4°C

Cyanide

14 days from date of collection, preserved to pH > 12 and 4°C

AVS/SEM

14 days from date of collection, kept at < 4°C

If no, list the affected samples/analytes and the number of days outside of the holding time or preservation issues in the table, below.

Actions:

If the holding times were exceeded, estimate (J and UJ) positive and nondetect results. If the holding times were grossly exceeded, estimate (J) positive results and reject (R) nondetect results. If samples were improperly preserved, use professional judgment – may estimate (J and UJ) associated results.

Holding Time / Preservation Actions

Analyte	Holding Time Exceedance	Preservation Issue	Action / Bias	Affected Sample(s) / Comments
		_		
-				
	-			
<u> </u>	1 + h	despolice	of mex	als were feltisal lection except for 6/21 + filtered 6/25/19) 2 + filtered 6/25). Liately after feltration
Sample	reignois 201	and the	5	a li de ant for
12000	& within	24 hr	d) Coll	action except the
m the ea		(O. Mostal	1/2 + Elferal 6/25/99)
50-10	SD-01, DU	- OZDUP	COLLECTE	6/2/ ////Con
,	5 C + SI	1209 (alla	11 6/23	2 + Silles 1 6/25).
and 5	D-08 1 7	~ (COLLEGE	THO WILL	An all Sin
S 0/2	. WYSO A	BEJENVEG	unna	liately after fullation
sample	a will pe			
1				

B. Calibration (continued)

2. Low Level Standard [Contract Required Detection Limit (CRDL)] Analysis

The Low Level Standard, or Contract Required Detection Limit (CRDL), is a direct measure of the instrument sensitivity near the detection limit.

- a. Review Form 2B, Inorganic CRDL Standard for AA and ICP
- b. Were the CRDL standards analyzed at the correct concentrations? Yes No.
- c. Did all CRDL standard results meet project or lab recovery criteria? Yes No.

If no, list the samples/analytes affected and actions in the table, below.

Actions:

If the CRDL recovery was greater than 150% (lab criteria), estimate (J) all positive results which were < 10x RL; no action is required for non-detects. If the CRDL recovery was less than 50% (lab criteria), estimate (J and UJ) positive and nondetect results <10x RL.

Low Level Standard (CRDL) Recovery Actions

Analyte	% Recovery CRDL Standard	Action / Bias	Affected Sample(s) / Comments
			NONE

~	F1 1.4	D11-	C	
2.	rieio.	Blank	RESU	ш

Field blank results were reviewed to assess the presence of contaminants that ultimately affect the accuracy and sensitivity of the sample results.

a. Was there a field rinsate blank (RB) associated with the samples in this SDG? Yes No. If yes list the field blank(s) and the associated samples in the table below.

Field Rinsate Blank Sample ID	Associated Field Sample IDs
	WA

b. Were all analytes detected in the field blank(s) at levels less than the MDL? Yes TNo. If no, list contaminants below.

NOTE: Use the maximum field blank concentration in cases where multiple field blanks are associated with the samples in a given SDG.

	-		
Field Blank	: ID:		
I IGIG DIGIIN	. 10.		

Analyte	Field Blank Result (Units)	
		NA
		7
		No FB associated with Seviface water Samples
		a sociated with
		associa da al m
		Sustace will
		Samoles
		1

D. Matrix QC Results

1. Matrix Spike Recoveries

Matrix spike (MS) results were reviewed to assess the accuracy of the results relative to the specific sample matrix.

- a. Review Form 5A, Spike Sample Recovery
- b. Were matrix spike (MS) results present for all analytes at the proper frequency as required by the Site QAPP? (Yes) No. Were matrix spike recovery criteria met for all analytes? Yes (No.)

List the affected analytes and actions in the table below.

Actions:

If the spike recovery was > 125%, estimate (J) all positive results. No action is taken for non-detects. If the spike recovery fell within the range of 30-74%, estimate (UJ or J) all sample results. If the spike recoveries were less than 30%, reject (R) the nondetect results as unusable and estimate (J) the positive results for extremely low bias.

If the sample concentration exceeds the spike-added concentration by a factor of 4 or more, no action is taken because the spike level was "swamped-out" by the native concentration in the sample.

Matrix Spike (MS) Accuracy Action Table

M5 performed on SD-3

Analyte	MS % Recovery	Action	Comments/Affected Samples
As- Total	129%	J	all arsenic total results -
		 	sotential high bigs
<u> </u>			
	 		
	1 1		<u> </u>

Data Usability Checklist Review - Inorganics Industri-Plex Site, Woburn, MA Ecological and Human Health Environmental Investigations 1999

D. Matrix QC Results (continued)

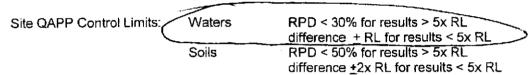
3. Field Duplicate Precision

Field duplicate sample results were reviewed to assess representativeness of the sample aliquot to the area sampled and the precision of the results relative to field sampling techniques.

a. Review Form 1, Inorganic Analysis Data Sheet, for the field duplicate sample analyses results

Actions:

If field duplicate precision exceeded criteria, below, for any analyte, estimate (J) positive results for the affected analytes in the field duplicate pair only. If severe imprecision was noted in the field duplicate results, qualify the remainder of the associated field sample data based on sound technical judgment.



Use professional judgment for results < 5x RL that do not meet the RPD criteria, above. [As guidance, Region 1 defines the following control limits: control limit of \pm 2x CRDL for water and \pm 4x CRDL for soil for results that are < 5x CRDL.]

Field Duplicate (FD) Precision/Representativeness Action Table 5D-02 DUP.

			900001:
· Analyte	FD RPD	Action	Comments/ Associated Samples
Total Metals	alla	Uticlia	results met FD precision.
	evaluate	An.	ND results: 36 /Be Cd Cr. Co Cu.
		0	Ha Se, Ag Tl Zn
Dissolved M	etals:	Met fo	all detected results except ison:
Fe	121%	5	Both assolved to results.
Could not	evaluate	LOT NO L	esults: Al, 5b, AS, Be, Cd., Cr, Co, Cu, Pb,
			Ha Ni Se Ag To V. Zh.
	·		·

E. Method QC (continued)

2. ICP Method QC - ICP Interference Check Sample Results

ICP interference check procedures were performed to evaluate and verify the laboratory's interelement and background corrections for ICP analyses.

- a. Review Form 4, ICP Interference Check Sample
- b. Were analyte levels in the ICSA and ICSAB reported for all metals? **Yes No.** Was the ICSA and ICSAB analyzed as the correct frequency as defined in SW846? **Yes No.** Did all analytes meet recovery criteria of 80-120% in the ICSAB solution? **Yes No.**
- c. Were the absolute values of the reported results for analytes in the ICSA check solution, other than Ai, Ca, Fe, and Mg, less than 2x RL? Yes (No.) All hellow
- d. Were the major interfering analytes (Al, Ca, Fe, and Mg) within linear range of the ICP instrument? Yes No. If no, were appropriate dilutions made to bring the interferent within linear range? Yes / No. If no, evaluate interferences based on lab IECs and Linear Range analyses and describe any actions taken, based on professional judgment and calculations to estimate the level of interference, below.
- e. Were other interfering analytes (Na) within linear range of the ICP Yes No. If no, evaluate potential physical interferences and take actions to estimate (J and UJ) affected analytes based on professional judgment. Include any actions below.

If no to any of the above, list the affected samples, analytes, concentrations and actions in the section below.

Comments:	No action to ten as levels of interferents in 105 solutions (for all ca feeling). Theyefore in terelement interference net

F. Verification of IDLs, Linear Ranges, IECs

1. Instrument Detection Limits

Analyte detection limits were reviewed to assess if the sensitivity of the results met the project-specific requirements.

- a. Review Form 10, or equivalent. For this project, Method Detection Limits (MDL) must be performed annually.
- b. Were current (annual) MDLs present for all analytes and all instruments used for analysis? Yes No.
- c. Were the MDLs compliant with project-specific reporting limit requirements as listed in Table 1-7 of the Site QAPP? Yes / No.

Actions: If no, estimate (J or UJ) all affected results that are < 10X MDL due to the uncertainty in the level of detection. List any actions in the Comments section, below.

2. ICP Interelement Correction Factors

- a. Review Form 11, or equivalent, ICP Interelement Correction Factors (Annually)
- b. Were the current (annual) IECs present in the data package? Yes No.

Actions: If no, use professional judgment to determine the severity of the affect on the results.

3. ICP Linear Ranges (Annual)

- a. Review Form 12, or equivalent, ICP Linear Ranges are checked daily and updated, at a minimum, annually for this project.
- b. Were current (annual) linear range data present in the data package? Yes No.

Actions: If no, use professional judgment to determine the severity of the affect on the results.

If no to questions for Forms 10, 11, or 12, list the affected samples/analytes and actions in the comment section, below.

Commen	S.								
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MDL	is 1.2	egle.	Demon91	rated 140	XI MSITI	estak	by an	Olypes O	(907)
						77		1	10107.
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H. Additional QA/QC Issues

Percent Solids

Percent solids data were reviewed to further assess the affect of the sample matrix on result quantitation.

- a. Review percent solids results for all soil and sediment samples on the Form 1s. Note that for this project, all sediment samples were freeze-dried prior to analysis for total metals. The freeze-dried percent solids is used to calculate the total metals results on a dry-weight basis; therefore, the freeze-dried percent solids is used to compare to EPA Region I DV criteria. For AVS/SEM, the "as-received" percent solids is used as AVS is volatile and freeze-drying carnot be performed.
- b. Were percent solids > 30% for all soil samples? Yes / No.

If no, list affected samples and actions in the table, below.

Actions:

If percent solids results were > 30%, no actions are required. If percent solids were < 30% but > 10%, reject all non-detected results (R) and estimate (J) all detected results. If percent solids were <10%, reject (R) all results. Professional judgment may be used to modify these actions. For example, AVS/SEM must be analyzed on the "as received" sediment without the freeze-drying preparation because AVS is volatile and may be lost upon freeze-drying. AVS/SEM data will not be rejected due to low percent solids because the molar ratio information is useful to the ecological risk assessors even in low percent solids sediments. The data may be estimated (J and UJ) based on professional judgment.

Percent Solids Action Table

Sample ID	% Solids	Action / Comments	
- 1			
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	 		mls.
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	+		
	 		
	1		

H. Review of Overall Data Package Compliance

Review of the overall data package was performed to determine if the laboratory met all EPA SW846 method and project QAPP requirements.

A. Case Narrative Review

1. Review the Case Narrative provided with the data package and list all issues of noncompliance or QA/QC exceedances addressed in the case narrative that have not been previously evaluated in the Data Usability Review. For each issue listed, state what qualification to the data has been taken.

Comments:
No fus ther essues.
W. Review of One Sample
The review of one sample per fraction for each data package was performed to determine if sample result and quantitation limits were correctly calculated and reported.
Sample ID SD-01 was selected for review in this data package. To tail Me tail Lab ID# 42574-3
A. Detection / Reporting Limit Review
Reproduce the sample detection limit for one analyte for each method (ICP, GFAA, CVAA, and cyanide). Did the laboratory correctly calculate the detection limits? Yes No. If no, list below the affected analytes.
NONE
List in the table below any results that did not meet reporting limits requirements as listed in the Site QAPP Table 1-7.
Results That Do Not Meet OAPP Rt. (Sensitivity) Requirements

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Analyte	Sample ID # (s) Affected	Highest RL reported (units)	QAPP RL (units)	Reason (% solids; blank action; etc.)
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	Manox	gan		
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		U		

Data Summary Key for Data Usability Checklist Review

- The associated numerical value is an estimated quantity due to quality control criteria exceedance(s). The value is usable for project decisions as an estimated result.
- U The analyte was analyzed for, but was not detected. The associated numerical value is the sample reporting/quantitation limit. The value is usable for project decisions as a nondetect result at the reporting limit.
- UJ The analyte was analyzed for, but was not detected. The associated numerical value is the sample reporting/quantitation limit and is an estimated quantity. The value is usable for project decisions as a non-detect result at the estimated reporting limit.
- R Reject data due to severe or cumulative exceedance of quality control criteria. The value is unusable (analyte may or may not be present) for project decisions. Re-sampling and reanalysis is necessary for verification.
- NA Not Analyzed

Data Usability Checklist Review - Inorganics Industri-Plex Site, Woburn, MA Ecological and Human Health Environmental Investigations 1999

Bibliography

Industri-Plex Trust, 1999. Toxicological Surface Water and Sediment Sampling and Fish Sampling Work Plan and Quality Assurance Project Plan for Industri-Plex Site, Woburn, Massachusetts, July 1999. Menzie, Cura & Associates, Chelmsford, MA.

USEPA, 1992. Guidance for Data Useability in Risk Assessment (Part A), Publication 9285.7-09A.

USEPA, 1994. Region I Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses, June 13, 1988, modified February 1989.

USEPA 1996. Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses.

Data Usability Review Organic Analysis by Modified Method 8270C, 8260B, 8081A, and 8082 EPA Region I Tier III - type review

Client:

Menzie-Cura & Associates, Inc.

Site:

Industri-Plex, Woburn, Massachusetts

Laboratory:

Woods Hole Group Environmental Laboratory, Raynham, MA

SDG: ETRs: 42547, 42551, 42574, and 42575

of samples/Analyses:

17 surface water and 6 field blank samples for Volatiles, Semivolatiles, Pesticides

and PCB analyses

Initial Reviewer: Dr. Nancy C. Rothman, New Environmental Horizons, Inc.

Senior Reviewer: Susan D, Chapnick, New Environmental Horizons, Inc.

Date Completed: October 18, 1999

The Data Usability Review, representing a Region I Tier III-type validation, was performed on the data package. The intentions of this review are: 1) to determine if the data were generated and reported in accordance with SW-846 Methods 8260B, 8270C, 8081A, 8082, the Toxicological Surface Water and Sediment Sampling and Fish Sampling Work Plan and Quality Assurance Project Plan for Industri-Plex Site, Woburn, Massachusetts, July 1999, Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses; Part II. Volatile/Semivolatile Data Validation Functional Guidelines, 12/96 2), and the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA540/R-94/012, February 1994; 2) to determine if the data met the program data quality objectives for acceptable accuracy, precision, and sensitivity; 3) to determine and define the technical usability of the data based on the accuracy, precision, and sensitivity OA/QC indicators; and 4) to update the project database with appropriate data quality qualifiers.

The Data Usability Review consists of five main sections. Section I is the Overall Summary of Data Usability including subsections addressing technical usability, accuracy, precision, and sensitivity of the data. Section II is the Data Package Completeness Review. Section III is the Review of the Laboratory Data Summary Forms and Additional QA/QC Parameters to determine if the QC requirements met and to determine the affect of exceeded QC requirements on the precision, accuracy, and sensitivity of the data. Section IV is the Review of the Overall Data Package to determine if contractual requirements were met. Section V is Example Sample Calculations to determine if the sample results and reporting limits were correctly calculated and reported by the laboratory.

I. Overall Summary of Data Usability

A. Summary of Technical Usability

All 17 surface water and 6 field blank results (including 1 Trip Blank and 5 Field Rinsate Blanks) for Volatile Organics (VOC), Semivolatile Organics (SVOC), Pesticides (Pest) and Polychlorinated Biphenyls (PCBs) included in the laboratory data package reviewed, identified by Woods Hole Group Environmental Laboratory (WHG) as project numbers (ETRs) 42547, 42551, 42574, and 42575 are usable for project objectives. Results have been estimated (UJ) for several compounds in all of the surface water samples and field blanks due to quality control criteria exceedances. Data users should note the following uncertainties in the estimated results. The estimated results are usable for project objectives.

B. Technical Issues Affecting Accuracy

Holding times, calibration criteria, surrogate recoveries, laboratory control sample recoveries, matrix spike/matrix spike duplicate recoveries, and other method-specific QC sample results were reviewed to evaluate the accuracy of the surface water results.

Volatile Organic Compound (VOC) Results

All quality control information, such as holding times, surrogate recoveries and matrix spike recoveries, associated with accuracy met QAPP and method criteria for the VOC results in these surface water samples.

Semivolatile Organic Compound (SVOC) Results

Surrogate recovery in one surface water sample was high, outside criteria for all three Base/Neutral surrogates. The laboratory speculated that a double spike of surrogate may have occurred during extraction. Since the sample did not report any positive results for SVOC, no action was taken to qualify the sample data.

All other quality control information, such as holding times, surrogate recoveries and matrix spike recoveries, associated with accuracy met QAPP and method criteria for the other SVOC results in these surface water samples.

Pesticide and PCB (Pest/PCB) Results

All quality control information, such as holding times, surrogate recoveries and matrix spike recoveries, associated with accuracy met QAPP and method criteria for the Pesticide and PCB results in these surface water samples.

C. Technical Issues Affecting Precision and Representativeness

The relative percent difference (RPD) between matrix spike and matrix spike duplicate results and between field duplicate pair results were evaluated to assess precision and representativeness of the surface water data.

Volatile Organic Compound (VOC) Results

Precision was acceptable for VOC results based upon the matrix spike (MS) and matrix spike duplicate (MSD) results. This is an indication of acceptable precision in the laboratory analysis of the surface and field blank waters within this SDG.

One field duplicate pair was associated with this SDG: SD-02 and SD-02DUP. The VOC results for both of these samples were all non-detect; therefore, precision from the field through analysis could not be assessed.

Semivolatile Organic Compound (SVOC)Results

Precision was acceptable for SVOC results based upon the matrix spike (MS) and matrix spike duplicate (MSD) results. This is an indication of acceptable precision in the laboratory analysis of the surface and field blank waters within this SDG.

One field duplicate pair was associated with this SDG: SD-02 and SD-02DUP. The SVOC results for both of these samples were all non-detect; therefore, precision from the field through analysis could not be assessed.

Pesticide/PCB (Pest/PCB) Results

Precision was slightly compromised for the Pest/PCB results based upon the matrix spike (MS) and matrix spike duplicate (MSD) results. The relative percent difference (RPD) for heptachlor was 38% (compared to QAPP criteria of RPD \leq 22%) and for gamma-BHC at 24% (compared to QAPP criteria of \leq 15%). All other MS/MSD components met QAPP precision objectives. Based on these MS/MSD results, the unspiked sample, SD-03, was qualified as estimated (UJ) for heptachlor and gamma-BHC. The precision of the analytical system did not meet project objectives for these two pesticide components; however, the non detected results for these compounds are usable as estimated values.

One field duplicate pair was associated with this SDG: SD-02 and SD-02DUP. The Pest/PCB results for both of these samples were all non-detect; therefore, precision from the field through analysis could not be assessed.

D. Technical Issues Affecting Sensitivity

Blank contamination in method and field blanks, initial and continuing calibrations, and MDLs were reviewed to assess sensitivity of the results compared to QAPP reporting limits.

Volatile Organic Compound (VOC) Results

The QAPP required reporting limit (RL) for all volatile analytes was 2 μ g/L. The laboratory reporting limit for all components, except acetone and methylene chloride, was 2 μ g/L, which corresponded to the sample-equivalent reporting limit of the laboratory's lowest concentration initial calibration standard. For acetone and methylene chloride, the lowest initial calibration standard was at 5 μ g/L; therefore, the reporting limit for these two compounds was 5 μ g/L for the surface water and field blank samples within this project. The methylene chloride and acetone RL of 5 μ g/L meets the Ecological and Human Health Risk Based Criteria for this project and are therefore, usable.

The method 8260B and Region 1 criteria for initial calibration of percent relative standard deviation (%RSD) \leq 30% was not met for bromomethane and methylene chloride (%RSD = 38.2% and 30.8%, respectively). The cause of the non-linearity for each of these compounds was investigated and it was shown that for bromomethane, elimination of the highest point calibration standard returned the %RSD to within criteria. For methylene chloride, elimination of the lowest level calibration standard returned the %RSD to within criteria. Based on Region 1 validation guidelines, since all results for bromomethane were non-detects, no action was taken to qualify the non-detected data since accuracy at the RL was established. For methylene chloride however, all results were qualified as estimated (UJ) due to uncertainty in quantitation at the sample-specific reporting limits. These estimated results are usable.

The method 8260B criteria for calibration verification of percent difference (%D) $\leq \pm 25\%$ was not achieved for several compounds in several continuing calibrations (see page 5- and 5A-VOA). Several non-detected results for bromomethane, chloromethane, chloromethane, and carbon disulfide in sixteen surface water samples and the Trip Blank (6/18/99) were qualified as estimated (UJ) due to exceedances of the %D in the Continuing Calibrations. These estimated non-detected results are usable.

The Trip Blank 6/18 contained trace-level acetone at 5 μ g/L and chloroform at 1 μ g/L. None of the surface water samples reported positive results for chloroform; therefore, no blank action was required for this compound. The Action level for acetone associated with this field blank was 50 μ g/L. Samples SD-06, SD-07Deep, SD-05Shallow, SD-02DUP, and SD-09, associated with this Trip Blank, also reported trace levels (below the RL) of acetone. Action was taken to negate (U) the acetone results in these five surface water samples and the level raised for acetone to the sample-specific reporting limit. These negated levels still meet the Ecological Risk Based Criteria for acetone and are usable.

All other VOC results met sensitivity requirements as stated in the QAPP project-specific reporting limits.

Semivolatile Organic Compound (SVOC) Results

The QAPP required reporting limit (RL) for all semivolatile analytes ranged from 5 to 12 μ g/L. The lowest concentration initial calibration standard actually used by the laboratory was 2 μ g/mL which is equivalent to a sample-specific RL of 4 μ g/L: lower than the QAPP required RL for most compounds. The QAPP RL for hexachlorocyclopentadiene was 5 μ g/L; however, the lowest concentration initial calibration standard for this compound was at 5 μ g/mL which corresponds to a sample-specific RL of 10 μ g/L. This compound was not detected in any sample. The laboratory incorrectly reported this compound using the 4 μ g/L RL; therefore, in all samples, the reporting limit for hexachlorocyclopentadiene was raised to the actual sample-specific limit achievable based on the lowest initial calibration standard at 5 μ g/mL. Conversely, the laboratory reported all data for 3-nitroaniline assuming a lowest initial calibration standard of 5 μ g/mL; however, the initial calibration showed that this analyte was present in the 2 μ g/mL calibration standard and that acceptable linearity across the initial calibration was achieved using this lowest standard. Therefore, the RL for 3-nitroaniline was lowered to the sample-specific level equivalent to the 2 μ g/mL standard and is consistent with the RL requested in the QAPP. These amended reporting limits still meet the Ecological Risk Based Criteria and are usable.

The QAPP required RL for 2,4-dinirophenol, 4-nitrophenol, 4,6-dinitro-2-methylphonel, pentachlorophenol, 2,4,5-tricholorophenol, 2-nitroaniline, and 4-nitroaniline was 12 μ g/L. In samples SD-02, SD-02DUP, SD-01, and SD-11, the actual sample-specific reporting limit for these compounds was 13 μ g/L due to limited sample volume for extraction. These reporting limits still meet the Ecological Risk Based Criteria and are usable.

The method 8270C and Region 1 criteria for initial calibration of percent relative standard deviation (%RSD) \leq 30% was not met for 2,4-dinitrophenol (%RSD = 72.2%), hexachlorobutadiene (%RSD = 33.0%), and 4,6-dintro-2-methylphenol (%RSD = 36.1%). These three compounds were not detected in any of the samples. For all three compounds, the lowest calibration standard response was the primary source for non-linearity, therefore, for all samples, the non-detected results for these compounds were qualified as estimated (UJ) due to uncertainty in quantitation near the RL.

The method 8270C criteria for calibration verification of percent difference (%D) $\leq \pm 25\%$ was not achieved for two compounds (hexachlorocyclopentadiene and dinitrophenol) in several continuing calibrations (see page 5-SVOC). The affected non-detected surface water and rinsate blank results for these compounds were qualified as estimated (UJ). The estimated results are usable.

Pesticide/PCB (Pest/PCB) Results

The QAPP required RL for methoxychlor 0.05 μ g/L. In samples SD-04 and SD-09 the RL for methoxychlor was 0.051 μ g/L and in sample SD-08 the methoxychlor RL was 0.053 μ g/L. These RLs were elevated due to limited sample volume for extraction.

The method 8081A/8082 criteria for calibration verification of percent difference (%D) or percent Drift (%Drift) $\leq \pm 15\%$ was not achieved for several compounds in several continuing calibrations (see pages 7-, 8-, 9-, and 9A-Pest/PCB). In addition, the laboratory convention for calculation of %Drift used a formula given in Method 8000B which reversed the numerator for the calculation (Method 8000B %Drift = (Found - True)/True as compared to standard convention of (True - Found)/True); therefore, all %Drift results cited in this report used the laboratory's convention for the calculation. Several non-detected results for alpha-BHC, gamma-BHC, 4,4'-DDT, endrin aldehyde, methoxychlor, and endrin ketone were qualified as estimated (UJ) in the associated surface water and field blank samples based upon the continuing calibration results. These estimated non-detected results are usable.

E. Additional Technical and QA/QC Issues

A review of method compliance, an evaluation of method modifications, and other QA/QC issues were made to evaluate the comparability of the data generated for the project uses.

Volatile Organic Compound (VOC) Results

The Form 5s, showing BFB Tune summary criteria, erroneously show the latest CLP SOW criteria for tune acceptance. The raw data from the GC/MS system accurately has the 8260B criteria and all tunes did meet these criteria. This is a reporting form error that the laboratory is aware of but can not fix using the software they currently employ.

The laboratory used the surrogate 1,2-dichloroethane-d₄ in place of the QAPP suggested surrogate dibromofluoromethane (two other surrogates were the same as suggested in the QAPP). In addition, the laboratory acceptance criteria for surrogate and MS/MSD recoveries were based on laboratory control charted limits as required by Method 8260B. These laboratory limits were in most cases tighter than those given in the QAPP and in all cases, were technically acceptable compared to the QAPP criteria.

Semivolatile Organic Compound (SVOC) Results

For semivolatile analysis, the laboratory spiked only the Base/Neutral surrogates into the samples prior to extraction. This was mistakenly done since this is the protocol the laboratory must follow for the extraction of the sediment samples (due to limited sample size, the semivolatiles, pesticides and PCBs are extracted together and addition of the Acid surrogates would interfere with pesticide analysis). Andy Beliveau, Region 1 QA Officer, was contacted and it was decided that action would be taken for the acidic semivolatile compounds if and only if the other QC elements, such as LCS and MS/MSD, showed poor acid compound recovery. Since the LCS and MS/MSDs were all acceptable for the acidic semivolatile compounds, no action was taken to qualify the semivolatile data based on the lack of acid surrogate spikes. The laboratory has amended this protocol and will in the future spike both Base/Neutral and Acid surrogates during the extraction of aqueous samples.

The Form 5s, showing DFTPP Tune summary criteria, erroneously show the latest CLP SOW criteria for tune acceptance. The raw data from the GC/MS system accurately has the 8270C criteria and all tunes did meet these criteria. This is a reporting form error that the laboratory is aware of but can not be fix using the software they currently employ.

Pesticide/PCB (Pest/PCB) Results

For Pesticide/PCB analysis, the laboratory used second-order curve statistics to develop the initial calibrations. An initial evaluation of the Pesticide calibrations showed that the laboratory had erroneously forced the curves through the origin during their curve statistics processing. The origin was not used in the PCB initial calibration curve processing. The laboratory was contacted on September 24, 1999 (Resubmittal issued) and they were asked to reprocess all initial calibrations without using the origin as a calibration point, to reprocess all continuing calibrations, and to reprocess any sample data which may have been affected by a change in calibration (e.g., no sample data required reprocessing since all results were non-detects; however, laboratory control spikes (LCS) and MS/MSD did require reprocessing). On October 11, 1999, reprocessed data were received for Pesticides and these data were inserted in the data package (the original data are included in the project files for documentation only). Note that this regeneration process resulted in different continuing calibration results in some cases. NEH initiated a corrective action and the laboratory has changed their Pesticides calibration to ensure that all future work does not force the calibration curves through the origin.

The pesticide and PCB analyses were performed on the same extract using a single long analysis run time to allow the determination of the pesticides and PCBs without interference. As such, the MS/MSD performed was done using only pesticide spikes – no PCB MS/MSD was performed. In addition, the laboratory used laboratory generated recovery acceptance criteria for the MS/MSD (and LCS) which were actually tighter than those given in the QAPP. Therefore, the laboratory limits for MS/MSD were considered acceptable for project objectives.

The precision acceptance criteria for the MS/MSD (RPD) were set by the laboratory at 50% on their report forms. This is greater than the acceptable RPD for precision defined in the Site QAPP (criteria ranged from 15% to 27% for different pesticide MS compounds). The laboratory was contacted and it was determined that the 50% level was an arbitrary precision value (not based on control charting); therefore, precision objectives during this assessment were judged versus those given in the QAPP and not based on the laboratory-reported precision criteria.

F. Summary of Completeness, Documentation, and Chain-of-Custody Issues

Chain-of-custody (COC) documentation of temperature on receipt at the laboratory was missing for several COCs. For samples received 6/21/99, a receipt temperature of 7°C was recorded. This exceeds the criterion of 4 ± 2 °C. The samples were collected in the summer and immediately sent via courier to the laboratory. Only surface water samples were collected associated with this COC. It appears that they did not have a chance to cool-down completely by the time they were received at the laboratory. No action was taken other than to note this discrepancy.

Due to a sampling miscommunication, a Trip Blank for VOC analysis was not taken on each day of sampling. A water Trip Blank accompanied the samples to the laboratory on June 18, 1999 (called Trip Blank 6/18). No Trip Blanks were received with the sampling events on June 17, 21, or 22, 1999. The one Trip Blank received was associated with all of the surface waters within this project. Note that samples were received at the laboratory within several hours of sampling on the same day of sampling for each sampling event.

Indication of "sediment" or "surface water" for the association of the five rinsate blanks was not made on the chain-of-custodies. However, personal communication with the sampler, Peter Kane of Woods Hole Group Environmental Laboratory, confirmed that the rinsate blanks were taken as rinses of the Eckman grab samplers used for sediment collection.

Times of sampling were not recorded on the chain-of-custody's for the sampling done on June 21 and June 22, 1999.

The data report received was missing a continuing calibration verification standard for VOC. On September 29, 1999, a resubmittal request asking for the missing calibration standard was issued. The missing data were received by fax on September 29, 1999 and inserted into the original data package. The data package was made complete and compliant with the receipt of the resubmittal.

The sampling information was incorrect in the excel database file of results (generated by the laboratory) for several samples. The corrected information was added to the sample results during this assessment. The project data file was made complete and compliant with these corrections.

The laboratory reported results for several analytes at a level below their reporting limit and qualified the data as estimated (J) due to uncertainty in quantitation. During this Data Usability Review, the "J" qualifier on data of this type was accepted, unless otherwise negated by actions taken during assessment, and was associated with the final results (i.e., the "J" was carried forward to the final data usability qualification of results).

NEH generated a data summary table based on the project data file supplied by the laboratory including the corrections and qualifications added to the data based on this Data Usability Review. The data summary table of technically valid and usable results for surface waters reviewed by NEH is attached to this report.

II. Data Package Completeness

The data package is reviewed for completeness using the Toxicological Surface Water and Sediment Sampling and Fish Sampling Work Plan and Quality Assurance Project Plan for Industri-Plex Site, Woburn, Massachusetts, July 1999.

- Were all required reporting forms and associated raw data included in the data package? Yes No. If no, contact laboratory for resubmittals and attach copy of resubmittal request to this checklist.
- 2. Was the data accompanied by a Data Review Checklist / Project Narrative explaining any non-compliance issues with the analyses? Yes No. Was the narrative complete? Yes No.
- 3. Were all samples listed in the laboratory data review checklists included in the data package? Yes No. Were all sample analyses requested on the Traffic report and Chain-of-Custody performed by the laboratory? Yes No. Were there any Chain-of-custody deviations noted? (e.g., labeling discrepancy between sample jar and COC, temperature outside of requirements, etc.) Yes No.

Comments:

- All COC'S NOTE T upm Receipt = 4°C -5°C	
- Surgen taken in 6/21/99 + 6/22/99 Did not record time of Say	Pling.
- Resubmittal 092999 Volatiles issued to obtain missing CCAL from 6/20	1/99-See
page 3A. Response from Lab received alealan via forx Resubmittle 092499 Peoticides issued since it was discovered atta	
lab had forced the calibration curso through the arigin for Pest Rissued pesticide data received 10/11/99	
- Sample 103 were inconsistently recorded on the COC	
All Sample 1Ds usere corrected in the format "SD-Di", for the data summary tables.	

34 Pheasant Run Drive, Skillman, NJ 08558 63 College Avenue, Arlington, MA 02474

Phone: (908) 874-5686 ◊ (781) 643-4294 ◊ Fax: (908) 874-4786

Email: NCR@ic.netcom.com @ Chapnick@world.std.com

New Environmental Horizons, Inc.



Water F	TR	s:42547, 42551, 4257	4. and 42575			
√ Urge:	nt	☐ For Review	☐ Please Con	nment	☐ Please Reply	☐ Please Recycle
	Vol	atile Organics			 ,	
	Ind	ustri-Plex Data				
Ro:	Re	submittal Request		CC:	Susan D. Chapnick	
Phones	508	3-822-9300		Date:	September 29, 1999	
Fax:	508	3-822-3288	<u> </u>	Pages:	1	
To:	Hel	dar Costa, WHG		From:	Nancy C. Rothman, I	Ph.D.

Volatile Continuing Calibration data

The continuing calibration on 6/29/99 on VOA#1 Lab file ID C1062901.D is missing from the data package. Please provide this missing CCAL.

Thank you for your prompt response to this resubmittal. Please forward your response to:

Nancy C. Rothman NEH, Inc. 34 Pheasant Run Drive Skillman, NJ 08558 phone: 908-874-5686 fax: 908-874-4786

34 Pheasant Run Drive, Skillman, NJ 08558 63 College Avenue, Arlington, MA 02474 Phone: (908) 874-5686 ◊ (781) 643-4294 ◊ Fact (908) 874-4786 Email: NCR@bunetcom.com ◊ Chapnick@world.std.com

New Environmental Horizons, Inc.



To:	Held	ar Costa, WHG		From:	Nancy C. Rothman, F	Ph.D.
Faxe	508-	822-3288		Pages:	1	
Phone:	508-	822-9300		Date:	September 24, 1999	
Re:	Res	ubmittal Request		CC:	Susan D. Chapnick	
	Indu	stri-Plex Data				
	Orga	ınics				
√ Urgei	nt	☐ For Review	☐ Please Com	ment	☐ Please Reply	☐ Please Recycle
This Do	ei ihm	ittal Paguest is to do	cument and conf	ion my t	elenhone conversation	n today with Pata

This Resubmittal Request is to document and confirm my telephone conversation today with Pete Kane regarding the issue below.

Pesticide Calibration data

In performing my review of the Pesticide's work on Industri-Plex, I saw that the initial calibrations for the Pesticides used calibration curve statistics for verifying the initial calibration and for performing quantitation of the Pesticides. All of the compounds reviewed used curves (i.e., not average Calibration Factors) and all indicate that the curve statistics were derived by FORCING THE CURVE THROUGH THE ORIGIN. This is unacceptable – the curves may NEVER be forced through the origin for a valid calibration. I reviewed the electronic files you sent on Industri-Plex and see that for several samples across all of the data submitted, that Pesticides were detected. These data need to be reprocessed using the correct calibration technique, re-quantitated, and re-reported. Please ensure that all of your staff (GC and GC/MS) know that curves may NOT be forced through the origin if used. I did a cursory check on the VOA and SVOC data and think that average RRFs were used here; however, expect a resubmittal request for these analyses if I do see any curve data.

Thank you for your prompt response to this resubmittal. Please forward your response to:

Nancy C. Rothman NEH, Inc. 34 Pheasant Run Drive Skillman, NJ 08558 phone: 908-874-5686 fax: 908-874-4786

Organic Data Usability Review

Data Summary Key for Data Usability Checklist Review

- The associated numerical value is an estimated quantity due to quality control criteria exceedance(s).
 The value is usable for project decisions as an estimated result.
- U The compound was analyzed for, but was not detected. The associated numerical value is the sample detection/quantitation limit. The value is usable for project decisions as a nondetect result at the reported detection/quantitation limit.
- UJ The compound was analyzed for, but was not detected. The associated numerical value is the sample detection/quantitation limit and is an estimated quantity. The value is usable for project decisions as a nondetect result at the estimated detection/quantitation limit.
- Reject data due to severe or cumulative exceedance of quality control criteria. The value is unusable (compound may or may not be present) for project decisions. Resampling and reanalysis is necessary for verification.
- TB The compound was detected in a Trip Blank
- EB The compound was detected in an Equipment Blank.
- BB The compound was detected in a Bottle Blank.
- NA Not Analyzed

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Organic Data Usability Review

Validation Checklist Review Acronyms

BB - Bottle Blank

CCAL - Continuing Calibration

CLP - Contract Laboratory Program

%D - Percent Difference = $(A - B)/A \times 100$

%Drift - Percent Drift = Percent Recovery = ((True-Found)/True X 100)

DQO - Data Quality Objective
EB - Equipment Blank (Rinsate)

EPA - Environmental Protection Agency

FB - field blank g - gram

GC/MS - Gas Chromatography/Mass Spectrometry

ICAL - Initial Calibration

Kg - kilogram L - liter

LCS - Laboratory Control Sample
MDL Method Detection Limit

MS - Matrix Spike

MSD - Matrix Spike Duplicate

mg - milligram
NA - not applicable
ND - non-detect

QA - Quality Assurance
QC - Quality Control
RL Reporting Limit

RPD - Relative Percent Difference ([(| A-B |) ½ (A + B)] X 100)

**RSD - Percent Relative Standard Deviation (SD/Average Value X 100)

SRM - Standard Reference Material
SVOC - Semivolatile Organic Compound

TCL - Target Compound List

TIC - Tentatively Identified Compounds

μg/Kg - micrograms per kilogram μg/L - micrograms per liter

Organic Data Usability Review

Bibliography

Toxicological Surface Water and Sediment Sampling and Fish Sampling Work Plan and Quality Assurance Project Plan for Industri-Plex Site, Woburn, Massachusetts, July 1999.

Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses; Part II. Volatile/Semivolatile Data Validation Functional Guidelines, 12/96.

Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Updates II and III (USEPA, Office of Solid Waste and Emergency Response, Washington, DC, September 1995 and December 1996). Methods 8260B, 8270C, 8081A, and 8082.

USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. EPA540/R-94/012, February 1994.

SUC 10/27/99 New Environmental Horizons, Inc.

12 8

Industri-Plex, Woburn, MA Site Locations - Organic Sú → Water Data

Validated 10/27/9° NEH, Ir

Client Sample ID:				SD-11		;	SD-10			SD-09			SD-08	Î	1
Lab Sample ID:				42574-5			42574-4	· · · · · · · ·		42575-2		 	42575-1		1
Sample Date:		Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	ΟV	06/22/99	Lab	DV	06/22/99	Lab	DV
Units		Qual.	Qual	ug/L	Qual.	Qual	ug/L	Qual.	Qual	ug/L	Qual.	Qual	ug/L	Qual.	Qual
Analyte-Volatile Organic Compounds (VOC)					I			<u> </u>						
EPA Method 8260B			!												
Chloromethane		2 U	UJ		2 U	U		2 U	U		2 U	U		2 U	U
Vinyl chloride		2 U	U		2 U	U		2 U	U		2 U	U	†	2 U	U
Bromomethane		2 U	UJ		2 U	IJ		2 U	ΠJ	1	2 U	UJ	1	2 U	UJ
Chloroethane		2 U	U		2 U	UJ		2 U	UJ		2 U	UJ	<u> </u>	2 U	UJ
Acetone		5 U	Ü		5 U	U		5 U	U		5 JB	U		5 U	U
1,1-Dichloroethene		2 U	U		2 U	U		2 U	U		2 U	Ü	1	2 U	U
Carbon disulfide		2 U	U		2 U	UJ	 	2 U	UJ	1	2 U	UJ		2 U	ÜJ
Methylene chloride		5 U	UJ		5 U	IJ		5 U	UJ	1	5 U	UJ		5 U	UJ
trans-1,2-Dichloroethene		2 U	U		2 U	U		2 U	U	1	2 U	U	 	2 U	U
1,1-Dichloroethane		2 U_	U		2 U	U		2 U	U	+	2 U	U		2 U	U
2-Butanone (MEK)		2 U	U		2 U	U		2 U	Ü		2 U	U		2 U	U
cis-1,2-Dichloroethene		2 U	Ų		2 U	U		2 U	U		1 J	J	1	2	
Chloroform		2 U	U		2 U	U		2 U	U		2 U	U	<u> </u>	2 U	U
1,1,1-Trichloroethane		2 U	U		2 U	U		2 U	U		2 U	U	<u> </u>	2 U	U
Carbon tetrachloride		2 U	U		2 U	U		2 U	U	1	2 U	U	<u> </u>	2 U	U
Велгеле		2 U	U		2 U	U		2 U	U		2 U	U	1	2 U	Ū
Trichloroethene		2 U	U		2 U	U		2 U	U		2 U	U		2 J	j
1,2-Dichloropropane		2 U	U		2 U	IJ		2 U	U		2 U	U	<u> </u>	2 U	U
Bromodichloromethane		2 U	Ų		2 U	Ų		2 U	U		2 U	U		2 U	U
Methyl isobutyl ketone (MIBK)		2 U	U		2 U	U		2 U	U		2 U	Ü	1	2 U	U
cis-1,3-Dichloropropene		2 U	U		2 U	U		2 U	U		2 U	U		2 U	U
Toluene		2 U	U		2 U	U		2 U	Ų		2 U	u	1	2 U	U
:rans-1,3-Dichloropropene		2 U	U		2 U	U		2 U	U	<u> </u>	2 U	υ	<u> </u>	2 U	U
1.1,2-Trichloroethane		2 U	U		2 U	U		2 U	U	 	2 U	U		2.U	U
2-Hexanone		2 U	U		2 U	U	<u> </u>	2 U	U		2 U	U	 	2 U	U
Tetrachloroethene		2.U	Ū		2 U	U	T	2 U	Ų		2 U	U	†	2 U	U
Dibromochloromethane		2 U	U		2 U	U	1	2 U	Ų	 	2 U	U		2 U	U
1,2-Dichloroethane		2 U	Ų		2 U	U		2 U	U		2 U	U		2 U	U
Chlorobenzene		2 U	U		2 U	U		2 U	U	 	2 U	U		2 U	u
Ethylbenzene		2 U	U		2 U	U		2 U	U		2 U	U	1	2 U	U
ɔ/m-Xylene		4 U	U	<u> </u>	4 U	U		4 U	U		4 U	† <u>-</u>		4 U	u
o-Xylene		2 U	U		2 U	U		2 U	U		2 U	U		2 U	U
Styrene		2 U	U		2 U	U		2 U	U	 	2 U	U	1	2 U	Ū
															
3romoform		2 U	Ū		2 U	U		2 U	U		2 U	U	1	2 U	U

industri-Piex, wodurn, MA Site Locations - Organic Surface Water Data

Client Sample ID:		, ————	<u> </u>	SD-07SHALL	OW		SD-06			SD-05DEEP		[SD-05SHALLO	W	T
Lab Sample ID:	42551-6			42551-7	;	T	42551-5	1		42551-8		 	42551-9	-	_
Sample Date:	06/18/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV
Units	ug/L	Qual.	Qual	ug/L	Qual.	Qual	ug/L	Qual.	Qual			Qual	ug/L	Qual.	Qual
nalyte-Volatile Organic Compounds (200
PA Method 8260B	1								 	-		_		_	
nloromethane		2 U	U	1	2 Ų	U		2 U	U	2	υ	u		2 U	lu -
nyl chloride	<u> </u>	1 J	J	1	2 U	U		2 U	Ū	3		-	 	2 U	U
romomethane		2 U	UJ	1	2 U	UJ		2 U	UJ	 	U	UJ	 -	2 U	UJ
hloroethane		2 U	U	1	2 U	U		2 U	U	 	u	u	 	2 U	U
cetone		5 J	U	<u> </u>	5 U	U		5 J	Ū		U	U	 	5 J	U
1-Dichloroethene		2 U	Ų		2.U	U		2 U	Ü	 	U	Ü		2 U	U
arbon disulfide		2 U	U		2 U	U		2 U	U	+	U	U	†	2 U	u
ethylene chloride		5 U	ΩJ		5 U	UJ	 	5 U	UJ	 	U	บป	 	5 U	Λη
ans-1,2-Dichloroethene		2 U	Ū		2 U	U		2 U	U		Ü	U	 	2 U	u -
1-Dichloroethane		2 U	U		2 U	u		2 U	u		U	u	 	2 U	ŭ
-Butanone (MEK)		2 U	U		2 U	U		2 U	U		Ū	U	 	2 U	U
is-1,2-Dichloroethene		6	Ī	<u> </u>	2	 		2	 -	13	+	<u> </u>	 	2	+
hloroform		2 U	U	1	2 U	u		2 U	U		Ų	U		2 U	U
,1,1-Trichloroethane		2 U	U	 	2 U	U	 	2 U	U		U	U	 	2 U	U
arbon tetrachloride	·	2 U	U	†	2 U	iU	 	2 U	U		Ū	ū	-	2 U	u -
enzene	6	3	†	 	2 U	Ū	 	2 U	U	190	 		 -	2 U	U
richloroethene	 	2 J	J		2 J	J	}	2 J	<u>-</u>	4			 	2 J	1
,2-Dichloropropane	+	2 U	U	 	2 U	U	-	2 U	U	 	U	U	 	2 U	ti-
iromodichloromethane		2 U	U		2 U	U		2 U	Ü	 	υ	U	 	2 U	U
lethyl isobutyl ketone (MIBK)		2 U	U		2 U	U	·	2 U	U		U	U		2 U	u
is-1,3-Dichloropropene		2 U	U	1	2 U	U	+	2 U	U	 	U	Ū	 -	2 U	U
oluene		2 U	U		2 U	U		4	 		U	U	 	2 U	U
ans-1,3-Dichloropropene		2 U	u		2 U	U		2 U	U	 	U	Ū	 	2 U	U
,1,2-Trichloroethane		2 U	U	1	2 U	U	(2 U	U	 	u	Ü	 	2 U	u
-Hexanone		2 U	u		2 U	U	<u> </u>	2!U	U		U	ū	 	2 U	U
etrachloroethene		2 U	U		2 U	Ų		2 U	U	 	U	U	<u> </u>	2 U	Ü
Dibromochloromethane		2 U	U		2 0	U		2 U	U		u	U		2 U	u -
,2-Dichloroethane		2 U	U		2 U	U		2 U	U		U	Ū	 	2 U	u
hlorobenzene		1 J	J	1	2 U	U		2,U	U	4	+	Ť-		2 U	u -
thylbenzene		2 U	·u	<u> </u>	2 U	Ü		 -	Ū	+	U	u	1	2 U	u
/m-Xylene		4 U	U	<u> </u>	4 U	U		4 U	U		J	j	 	4 U	u
-Xylene		2 U	u		2 U	U		2 U	U	 	U	U	 	2 U	U
Styrene		2 U	Tu Tu		2 0	U	+	2 U	U		U	U	 	2 U	U
Bromoform		2 U	U		2 U	U	· · · · · · · · · · · · · · · · · · · ·	2 U	U		U	<u>U</u>	 	2 U	U
.1,2,2-Tetrachloroethane	 	2 U	Ü	 	2 U	U		2 U	U	+	U	U	 	2 U	U

:			
Client Sample ID:	TRIP BLANK		
Lab Sample ID:			<u> </u>
Sample Date:	06/18/99	Lab	DV
Units	ug/L	Qual.	Qual
Analyte-Volatile Organic Compounds (\			
EPA Method 8260B			
Chloromethane	2	U	U
Vinyl chloride	2	U	U
Bromomethane	2	U	2
Chioroethane	2	U	U
Acetone	5	J	J
1,1-Dichloroethene	2	U	Ų
Carbon disulfide	2	U	U
Methylene chloride	5	U	UJ
trans-1,2-Dichloroethene	2	U	U
1,1-Dichloroethane	2	U	U
2-Butanone (MEK)	2	U	U
cis-1,2-Dichloroethene	2	U	U
Chiaroform	1	J	J
1,1,1-Trichloroethane	2	U	C
Carbon tetrachloride	2	U	u
Benzene	2	U	U
Trichloroethene	2	U	U
1,2-Dichloropropane	2	U	U
Bromodichloromethane	2	U	U
Methyl isobutyl ketone (MIBK)	2	U	U
ля-1,3-Dichloropropene	2	U	U
Toluene	2	U	U
rans-1,3-Dichloropropene	2	u	U
1,1,2-Trichloroethane	2	U	U
2-Hexanone	2		U
Tetrachioroethene	2	U	U
Dibromochloromethane	2	U	U
1,2-Dichloroethane		U	U
Chlorobenzene	2	U	U
Ethylbenzene	2	U	U
ɔ/m-Xylene	4	U	U
o-Xylene	2		U
Styrene	2	U	U_
3romoform	2	U	U
1.2,2-Tetrachloroethane	2	Ų	U

Industri-Plex, Woburn, MA Reference Locations - Organic Surface Water Data

	100.01	,	,				· guillo oui								
nple Location ID:	SD-01			SD-02		<u> </u>	SD-02DUP			SD-03			SD-03DEE	P	
Sample ID:	42574-3		 	42574-1	 -	ļ	42574-2	ļ		42551-1			42551-2		
e Sampled:	06/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV
ts	ug/L	Qual	Qual	ug/L	Qual.	Qual	ug/L	Qual.	Qual	ug/L	Qual.	Qual	ug/L	Qual.	Qual
alyte-Volatile Organic Compounds	(VOC)		<u> </u>				Field Duplica	te			!				1
A Method 8260B								-			ļ				
loromethane		2 U	U	2	Ù	U	2	U	U		2.U	U		2 U	Ü
yl chloride		2 U	U	2	≀ U	U	2	!U	U		2 U	U	<u> </u>	2 U	u u
amomethane		2 U	UJ	2	2 U	UJ	2	₽.Ų	UJ		2 U	UJ		2 U	UJ
loroethane		2 U	UJ	2	U	UJ	2	U	UJ		2 U	U	 	2 U	U
etone	_	5 U	U	5	Ū	U	5	JB	U	+	5 U	U	 	5 U	Ü
-Dichloroethene		2 U	U	2	2 U	U	2	. u	U		2 U	Ų		2 U	Ŭ
irbon disulfide		2 U	UJ	2	2 U	UJ		U	UJ		2 u	U	 	2 U	Ü
ethylene chloride		5 U	บา	 	i U	ุ่บป	+	ilu	UJ		5 U	UJ	 	5 U	UJ
ns-1,2-Dichloroethene		2 U	U	7	2 U	U	2	2 U	U	+	2 ₁ U	U	<u> </u>	2 U	U
1-Dichloroethane		2 U	U	7	2 U	U		ט	U		2 U	Ü		2 U	U
Butanone (MEK)		2 U	1 _U	7	2 U	U	2	2 U	Ū		2 U	U	 	2 U	u
3-1,2-Dichloroethene		2 U	U	7	2 U	U	 	2 U	U	 -	2 U	U	1	2 U	U
tloroform		2 U	U		2 ₁ U	U	2	2 U	U	-	2 U	U	† -	2 U	U
1,1-Trichloroethane		2 Ú	Ų	 	2 U	U	<u> </u>	210	U		2 U	iu -	 	2 U	u
arbon tetrachloride		2 U	U	2	2 U	U		2 [∫] U	U	<u> </u>	2 U	U		2 U	U
enzene		2 U	U	2	2 U	U	2	2 U	U	+ 	2 U	iu	 	2 U	U
ichloroethene		2 U	U	2	2 U	U		!U	U		2 U	U		2 U	u
2-Dichloropropane		2 U	U	2	Ų	U	2	2 U	U	+	2 U	U	 	2 U	U
romodichloromethane		2 U	U		2 U	U	2	2 U	U		2 U	u	T	2 U	U
ethyl isobutyl ketone (MIBK)		2 U	U		Ų	U	2	ייוַע	U		2 U	U		2 U	U
s-1,3-Dichloropropene		2 U	U	2	2 U	U	2	2 U	U		2 U	U		2 U	U
oluene		2 U	U		2 U	U	2	2 U	U		2 U	U	1	2 U	U
ans-1,3-Dichloropropene		2 U	U		2 U	U	2	2 U	U		2 U	U	1	2 U	U
1,2-Trichloroethane		2 U	U_	2	Ų	U	2	2 0	U		2 U	U		2 U	Ü
Hexanone		2 U	U	2	2 U	υ	2	2 U	U	T	2 U	U		2 U	U
etrachloroethene		2 U	U	7	2 U	บ	2	2 U	U	<u> </u>	2 U	U	 	2 U	u
ibromochloromethane		2 U	U	2	2 U	U	2	2 Ū	U		2,U	U	 	2 U	Ü
,2-Dichloroethane		2 U	U	2	2 U	U	 	? U	<u>'</u> '		2 U	U		2 U	U
hlorobenzene		2 U	U	2	2 U	Ų		2 U	Ū	+	2 U	U	 	2 U	U
thylbenzene		2 U	U	1 2	2 U	U	2	2 U	U		2 U	U	 	2 U	U
/m-Xylene		4 U	U		U	<u> </u>	† 	ı U	U		4 U	Tu -	 	4 U	u
-Xylene		2 U	U		2 0	U	†	2 U	U	·	z U	U	 	2 U	u
tyrene		2 U	U		טי	U		2 U	u		2 U	Ü		2 U	U
ramaform		2 U	U	 	? U	iU	·	U	U	+	2 U	U		2 U	U
1,2,2-Tetrachloroethane		2 U	ุ่บ		! U	U	t	-	Ū.	 	2 U	U	 	2 U	U
· · · · · · · · · · · · · · · · · · ·					٠		<u> </u>		<u> </u>	<u> </u>	- 1 -	Ü	1	470	

Sample Location ID:	SD-04		Ţ	SD-12		
Lab Sample ID:	42547-1	i -		42547-3		
Date Sampled:	06/17/99	Lab	DV	06/17/99	Lab	DV
Units	ug/L	Qual.	Qual	ug/L	Qual.	Qual
Analyte-Volatile Organic Compounds (
EPA Method 8260B						T
Chloromethane	2	U	UJ		2 U	UJ
Vinyl chloride	2	U	Ų		2 U	U
Bromomethane	2	U	UJ		2 U	ŲĴ
Chloroethane	2	Ų	U		2 U	U
Acetone	5	U	U	-	5 U	U
1,1-Dichloroethene	2	U	U	·	2 U	U
Carbon disulfide	2	U	U		2 U	U
Methylene chloride	5	U	UJ		5 U	IJ
trans-1,2-Dichloroethene	2	U	U		2 U	U
1,1-Dichloroethane	2	U	U		2 U	U
2-Butanone (MEK)	2	U	U		2 U	U
cis-1,2-Dichloraethene	2	U	U		2 U	U
Chloroform	2	U	U		2 U	U
1,1,1-Trichloroethane	2	U	U		2 U	U
Carbon tetrachloride	2	U	U		2 U	U
Benzene	2	U	U		2 U	U
Trichlaroethene	2	U	U		2 U	U
1,2-Dichloropropane	2	U	U		2 U	U
Bromodichloromethane	2	U	Ų		2 U	U
Methyl isobutyl ketone (MIBK)	2	U	U		2 U	U
cis-1,3-Dichloropropene	2	U	υ		2 U	U
Toluene	2	+	U_		2 U	U
trans-1,3-Dichloropropeле		U	U		2 U	U
1,1,2-Trichloroethane		U	U		2 U	U
2-Hexanone	+ ·	U	U		2 U	U
Tetrachloroethene	2	U	U		2,U	U
Dibramochloramethane	2	U	U		2 U	U
1.2-Dichloroethane	2	U	ĮŪ		2 U	U
Chlorobenzene	2	[}] U	יט		2 U	U
Ethylbenzene	2	Ų	U		2 U	U
p/m-Xylene	4	U	Ū		4 U	U
o-Xylene	2	U	U		2 U	Ų
Styrene	2	U	U		2 U	U
Bromoform	2	U	U		2 U	U
1,1 2,2-Tetrachloroethane	2	Ų	U		2 U	U

industri-Plex, Woburn, MA Site Locations - Organic Surface Water Data

Client Sample ID:	 	ļ <u> </u>	ļ	SD-11			SD-10			SD-09			SD-08		T
Lab Sample IO:				42574-5			42574-4		 -	42575-2			42575-1	-	
Sample Date:	06/17/1999	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/22/99	Lab	DV	06/22/99	Lab	DV
Units	<u> </u>	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.		Qual.	Qual.	ug/L		Qual
Analyte-Semivolatile Organic Compour	nds (SVOC)											-	 		
EPA Method 8270C]			-				· · · · ·			 			
bis(2-Chloroethyl)ether	5	U	U		5 U	U	T	4 U	U		4 Ų	U	 	4 U	lu -
Phenoi	5	U	U		5 U	U		4 U	l u		4 U	lu	 	4 U	lu –
2-Chlorophenol	5	U	U		5 U	lu	1	4 U	lu -	 	4 U	u	 	4 U	lu -
1,3-Dichlorobenzene	5	U	U	†	5 U	U		4 U	u —	 	4 U	<u> </u>	 	4 U	U -
1,4-Dichlorobenzene	5	Ų	U	<u> </u>	5 U	tu —	 	4 U	 	 -	4 U	11	 	4 U	U
1,2-Dichlorobenzene	5	U	u		5 U	U	1	4 U	u	 	4 U	 	 	4 U	lu-
bis(2-chloroisopropyl)ether	+- 	U	U		5 U	Ū	 	4 U	<u> -</u>	 	4 U	111	 	4 U	lu-
Hexachloroethane		U	Ū	<u> </u>	5 U	U	<u> </u>	4 U	U	 	4 U	U.	 	4 U	U
N-Nitroso-di-n-propylamine	· —	U	U	† 	5 U	Ū	 - · ·	4 U	U -	 	4 U	U U	 	4 U	 0
Nitrobenzene	·	i U	U	1	5!U	U U	 	4 U	<u> </u>	 	4 U	u	 	4 U	U
Isophorone		, U	Ū	1	5;U	u u		4 U	lu –	 	4 U	U	 	4 U	lu-
2-Nitrophenol	+	ناز	Ü		5 U	ΙŪ	 	4 U	l u		4 U	U	 -	4 U	t u -
2,4-Dimethylphenol	·		Ü	†	5 U	lu	†	4 U	lu —	· · · · · · ·	4 U	u	 -	4 U	Tu-
bis(2-Chloroethoxy)methane	+	. U	Ū	<u> </u>	5 U	υ -	†	4 U	lu -	 	4 U	U -	 	4 U	lu -
2,4-Dichlorophenol	+	i U	U -	 	5 U	Tu	†	4 U	tu —		4 U	U	<u> </u>	4 U	Tu-
1,2.4-Trichlorobenzene		i U	U -	<u> </u>	5 U	U		4 U	u	f	4;U	u	 	4 U	10-
Naphthalene	+	Ū	U	 	5 U	u	·j·	4 U	U	<u> </u>	4 U	U	 	4 U	lu -
Hexachlorobutadiene		i u -	UJ	1	5 U	UJ	 	4 U	UJ		4 U	ÜJ	 	4 U	UJ
4-Chloro-3-methylphenol	5	i,U	U	 	5 U	U	 	4 U	U	 	4 U	u	-	4 U	u
Hexachlorocyclopentadiene	+ -	U	UJ		13 U	lu	 	10 U	u -	······	11 U	U	 	11 U	Ū
2,4,6-Trichlorophenol	 	U	U		5 U	lu	 	4 U	l <u>u</u>		4 U	u		4 U	Ū
2-Chloronaphthalene	· +	i U	U	 	5 U	U		4 U	u		4 U	Tu -	 	4 U	U
Acenaphthylene	 	i U	U	<u> </u>	5 U	U	 	4 U	u .	f	4 U	U	i	4 U	lu -
Dimethylphthalate		U	U	 	5 U	lu -		4 U	lu -		4 U	U		4 U	U
2,6-Dinitrotoluene	 	i U	Ū	- -	5 U	U	 	4 U	u -		4 U	U	 -	4 U	U
Acenaphthene	 	U	u –	†	5 U	lu -	 	4 U	ū		4 0	u	 	4 U	10-
2,4-Dinitrophenol	+	20	UJ -	~~~	13 U	UJ	 	10 U	UJ U	 	11¦U	UJ	 	11 U	LUJ O
2,4-Dinitrotoluene	†	i U	U	 	5;U	U	 	4 U	U U	 -	4 U	11	 -	4 U	03
4-Nitrophenol		2 U	U	 	13 U	Ju	 	10 U	lu —	 	11 U	U	 	11 U	U
Fluorene		S U	Ū	 	5 U	U	 	4 U	lu –		4 U	U	 	4 U	U
4-Chlorophenyl-phenylether	·		u	 	5 U	U	 	4 U	 	 	4 U	U	1	4 U	U
Diethylphthalate		u -	U	·	5 U	lu	 	4 0	Ū	 	4 U	U	 	4 U	U
4,6-Dinitro-2-methylphenol	 	U	UJ	 	13 U	טט	 	10 U	טט	 	11 IU	רח	 	11 U	UJ
n-Nitrosodiphenylamine			U	 	5 U	lu	 	4 U	0	 	4 U	U	 	4 U	103-
4-Bromophenyl-phenylether	† 	i U	U	 	5 U	10 -	 	4 U	U -	 	4 U		 		 -
Hexachlorobenzene		U U	υ	 	5 U	U	 	4 U	<u> </u>	 		U I	 	4 U	U
	<u> </u>	15	<u></u> _	Ĺ	J}V	10	1	410	ĮΨ	7	4 U	U	į	4 U	Jυ

U-Compound was non-detected. Associated value is sample-specific reporting limit. J-Result was estimated due to quality control exceedance. UJ-Compound was non-detected at estimated reporting limit.

Client Sample ID:	SD-13		,	SD-11	1	<u> </u>	SD-10		1	SD-09		i	SD-08	 	1
Lab Sample ID:				42574-5	 	- -	42574-4			42575-2	 	<u> </u>	42575-1	!	
Sample Date:		Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/22/99	Lab	DV	06/22/99		5 14
Units			Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual	Qual.	ug/L	Lab Qual.	DV Qual
Analyte-Semivolatile Organic Compour	ds (SVOC)				+		143.5	-	-	-g/ -	Quu.	GUEI.	ug/c	Qual.	Quai.
EPA Method 8270C	· · ·			<u> </u>		 			 -		-	 			
Pentachlorophenol	12	U	Ü	1	3 U	u		10 U	U	- 11	U	U	- 44	U	U
Phenanthrene		U	l ū —		5 U	u	 	4 U	l u	 	u	lu		U	u
Anthracene	5	U	Ū		5 U	u		4 U	U		U	U		U	U
Di-n-butylphthalate	5	U	U	 	5 U	ν.	 	4 U	U		U	lū		U	u
Fluoranthene		U	υ		5 U	U		4 U	u	·	U	lu	 	U	u
Pyrene		U	υ		5 U	U	 	4 U	u	 	įυ	u	 	U	u -
Butylbenzylphthalate	5	U	U		5 U	u		4 U	Ū	 -	U	U	 	U	U
3,3'-Dichlorobenzidine	5	U	U	1	5 U	U		4 U	U	+	U	Ū		U	u
Benzo[a]anthracene	5	U	U	 	5 U	u	 	4 U	U	 	U	lu	1	U	lŭ-
Chrysene	5	U	U	 	5 U	Ů		4 U	U		iu	lu —		U	u
bis(2-Ethylhexyl)phthalate	5	U	υ	 	5 U	U	-	4 U	U	 -	U	u		U	lu –
Di-n-octylphthalate	5	U	U		5 U	Ū		4 U	Ū.		U	lu	+	U	u
Benzo[b]fluoranthene	5	U	Ū		5 U	U		4 U	ů.	+	U	10		u	u
Benzo[k]fluoranthene	5	U	U		5 U	U		4 U	U	 	U	u	· · · · · · · · · · · ·	U	u
Benzo[a]pyrene	5	Ū	U	 	5 U	lυ		4 U	lu -		U	lu -	4	 	Ū
Indeno[1,2,3-cd]pyrene	5	Ų	U		5 U	U		4 U	lu	 	U	u	 	U	Ū
Dibenz[a,h]anthracene	5	U	U		5 U	u	 	4 U	U	 	U	U		U	ū
Benzo[g,h,i]perylene	5	U	U		5 U	u		4 U	Ū	+	U	<u> </u>		u	Ü
2-Methylphenol	5	U	U		5 U	Ū		4 U	U	+	u	111	 	U	u -
4-Methylphenol	5	Ų	U		5 U	u	 · · · · · · -	4 U	Ü		Ú	U -		U	Ū
4-Chloroaniline	5	U	U		5 U	U		4 U	Ū		u	U		U	u
2-Methylnaphthalene	5	U	υ		5 U	Ü		4 U	U	t	U	U	+ ~ 	U	U
2,4,5-Trichlorophenol	12	U	Ų	1	3 U	U	<u> </u>	10 U	U	·1 	U	U	 	U	u
2-Nitroaniline	12	Ų _	Ų	1	3 U	U		10 U	Ū	+	U	U -		U U	Ū
3-Nitroaniline	5	U	U		5 U	U		4 U	U	+	U	Ū	<u> </u>	Ū	U
Dibenzofuran	5	U	u	 	5 U	u		4 U	Ū	 	U	U		U	u
4-Nitroaniline	12	Ų	u	1	3 U	U		ט סו	Ū	+··	U	U	·	u	u
Carbazole	5	U	U		5 U	u	<u> </u>	4 U	u	 	U	U		U	Ü

Industri-Plex, Woburn, MA Site Locations - Organic Surface Water Data

Validated 10/27/99 NEH, Inc.

Client Sample ID:		1		SD-07SHALLOW		1	SD-06			SD-05DEEP			SD-05SHALLOV	Mi −	7
Lab Sample ID:	42551-6			42551-7	-	1	42551-5	!	 	42551-8			42551-9	+	+
Sample Date:	06/18/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	ov	06/18/99	Lab	DV	06/18/99	Lab	ΙDV
Units	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.
Analyte-Semivolatile Organic Compour														1	+===
EPA Method 8270C		1							 		 		 	-	+-
bis(2-Chloroethyl)ether		4 U	U	4	U	U		5 Ų	U	4	Ü	U	 	4 U	lü
Phenol		4 U	U	4	U	U	 	5 U	Ū	5	<u> </u>	-	+	4 U	lu –
2-Chlorophenol		4 U	U		Ü	U	 	5 U	u u		U	lu -		4 U	u
1,3-Dichlorobenzene		4 U	U	4	U	U	 	5 U	U	 	u	Ū	+	4 U	<u> </u>
1,4-Dichlorobenzene		4 U	U	4	υ	U		5 U	Ū	 	U	tu	+ 	4 U	iu -
1,2-Dichlorobenzene		4 U	U		U	U	 	5 U	l ù		U	lu	· • - · · · ·	4 U	<u>υ</u> –
bis(2-chloroisopropyl)ether		4 U	U	4	U	U	 	5 U	u		U	lu -	+ 	4 U	l u -
Hexachloroethane		4 U	U	4	Ų	U	 	5 U	lu		U	tu		4 U	- <u>-</u>
N-Nitroso-di-n-propylamine		4 U	U	 	U	U	 	5 U	tu		U	U	 	4 U	lu
Nitrobenzene		4 U	U	 	U	lu -	<u> </u>	5 U	lu	 	.U	U	 -	4 U	U I
Isophorane		4 U	U	 	U	U		5 U	υ U	 	u	l u		4 U	lu –
2-Nitrophenol	1	4 U	lu	+	U	U		5 U	u	 	U	U		4 U	U U
2,4-Dimethylphenol	†	4 U	U	 	U	U	<u> </u>	5 U	lu	+	U	u	 	4 U	u
bis(2-Chloroethoxy)methane	 	4 U	lu	4	U	u	i	5 U	U		U	U.	1	4 U	lu –
2,4-Dichlorophenol	+ -	4 U	Ū		U	u	 	5 U	U	+	U	U	<u> </u>	4 U	17
1,2,4-Trichlorobenzene	 	4 U	lu	 	U	U	 	5 U	t i	 	U	U	 	4 U	u
Naphthalene		4 U	<u> 1</u>		U	u	·	5 U	lu		U	lu —		4 U	lu -
Hexachlorobutadiene	 	4 U	UJ	 	U	luj -	f	5 U	ייי	 	U	N)	 	4 U	UJ
4-Chloro-3-methylphenol		4 U	u	4	U	lu -	<u> </u>	5 U	lu	 	U	u -		4 U	U
Hexachlorocyclopentadiene	 	1 U	UJ	11	U	UJ	1	10	luj L		U	N)		0 0	UJ.
2,4,6-Trichiorophenol		4.U	U	1 4	U	U		5 U	lu -	 	U	U		4 U	u
2-Chioronaphthalene		4 U	U	4	U	U	1	5 U	Tu —	 	U	u		4 U	Tu -
Acenaphthylene		4 U	U	<u> </u>	IJ	U		5 U	 -	 	U	U	 	4 U	 -
Dimethylphthalate	 -	4 U	U		U	U		5 U	Ιυ .	+	U	Ū	 	4 U	u
2,6-Dinitrotaluene	 -	4 U	lu		U	u -	 	5 U	Tu		U	lu -	 	4 U	U
Acenaphthene		4 U	ū	 	ι υ	U	†	5 U	u	· 	U	lu		4 U	u u
2,4-Dinitrophenol	 	1 U	UJ	1 11	U	UJ	 	1 U	UJ.	 	U	บัว	1	0 0	ÛŊ 1
2,4-Dinitrotoluene		4 U	u		U	U		5 U	u -	 	U	U	<u> </u>	4 U	U
4-Nitrophenol		1 U	u	 	U	Ū	1	1 U	Tu	·}	U	U	1 1	0 U	U
Fluorene	 	4 U	U	 	U	Ū	1	5 U	Ū	+	U	u	 	4 U	Tu I
4-Chlorophenyl-phenylether		4 U	U		U	10-	 	5 U	U		U	lu		4 U	10 -
Diethylphthalate	 	4.U	U		U	u	1	5 U	U	 	U	u -	 	4 0	- -
4,6-Dinitro-2-methylphenol	+	1 0	nn 1		U	luj I	 -	11 U	ווו	 	Ų	UJ	 	10.0	100
n-Nitrosodiphenylamine	·	4;U	U	 	U	U	 	5 U	U		U	U	-	4 0	100
4-Bromophenyl-phenylether		4 U	U	· · · · · · · · · · · · · · · · · · ·	U	lu	 	5 U	+ —	·	+	 		4 U	1
Hexachlorobenzene	·	4 U	<u> </u>	1 	U	U	t	5 U	U		U	U		4 U	U U

U-Compound was non-detected. Associated value is sample-specific reporting limit. J-Result was estimated due to quality control exceedance. UJ-Compound was non-detected at estimated reporting limit

Industri-Plex, Wohrrn, MA Site Locations - Organic S ce Water Data

Validated 10/27"
NEH.

00-18	Ioo arases	,		Do escuera - C	18411		Ce Wate	-	,					116,11	<u>'</u>
Client Sample ID:		ļ	<u> </u>	SD-07SHALLOW	 	 	SD-06	<u> </u>	<u> </u>	SD-05DEEP			SD-05SHALLOW		<u> </u>
Lab Sample ID:	·		ļ	42551-7	ļ		42551-5			42551-8	<u> </u>		42551-9		i
Sample Date:	+	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV
	ug/L	Qual.	Qual.	ug/L	:Оваі.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.
Analyte-Semivolatile Organic Compou	1				!										
EPA Method 8270C															
Pentachlorophenol	11	Ų	U	11	ับ	υ	1	1 U	U	11	U	U	10	IJ	U
Phenanthrene	4	U	υ	4	U	U	-	5 U	U	4	U	U	 	U	u
Anthracene	4	U	U	4	U	U		5 U	U	4	U	U		U	U
Di-n-butylphthalate	4	U	U	4	U	U		5 U	lυ	1	U	u		Ü	lū -
Fluoranthene	4	U	υ	4	U	U		5 U	U	+	u	U		U	<u> </u>
Pyrene	4	U	υ		U	U		5 U	Ū	 	U	U		U	u
Butylbenzylphthalate	4	U	lu	4	U	U	 	5 U	u	 		Ū.		U	<u> </u>
3,3 -Dichlorobenzidine	4	U	U	 	U	u	·	5 U	lu -		U	Ū		U	lu -
Benzo[a]anthracene		U	U		U	<u>-</u>		5 U	lu -	-		U		<u> </u>	u
Chrysene		U	υ		U	Tu Tu		5 U	l u		U	U		U	u
bis(2-Ethylhexyl)phthalate	· 	Ū.	Ū		U	LI		5 U	U		U	u		U	10-
Di-n-octylphthalate	4	U	lū		U	u	+	5 U	lu		U .	u -		U	lu –
Benzo[b]fluoranthene	4	U	Ū		U	u -	 -	5 U	u -			U	 	U	lu -
Benzo[k]fluoranthene	4	Ų	U		U	ŭ		5 U	U			Ū		U	u
Benzo(a)pyrene	4	U	U		U	U		5 U	 		Ų	Ū		U	u
Indeno[1,2,3-cd]pyrene	4	U	U		U	Ü		5 U	u	1 	U	lu		U	Įϋ—
Dibenz[a,h]anthracene	4	u	U	4	U	U		5 U	Ū	 	U	υ		U U	u u
Benzo[g,h,i]perylene	4	U	U	4	U	Ų	·	5 U	lυ		U	U		U	Ju
2-Methylphenol	4	U	U	4	U	U	 ~ -	5 U	Ū	+	U	Ū		U	u
4-Methylphenol	4	U	U	4	U	U		5 U	U		U	Ū		υ	U
4-Chloroaniline	4	U	U	4	U	U	·	5 U	u -		Ų	<u>υ</u>		U	lu
2-Methylnaphthalene	4	U	U	4	U	U		5 U	ι ·	 	U	U	 	υ	lu
2,4,5-Trichlorophenol	11	u	U		U	U .		1 U	Tu u	11		u	10		U -
2-Nitroaniline	11	U	Ū	·	Ū	Ū		1 U	U	11	·	u	10		lu —
3-Nitroaniline	4	U	u	 	U	U	 	5 U	<u> </u>	t- <i></i>	U	U	·	υ	U
Dibenzofuran		U	Ū	 	U	U	+	5 U	10	 	υ	u		U	lu -
4-Nitroaniline	11	U	lυ		U	Ü		1 0	<u>.</u>	11		u	10		U
Carbazole		U	u		U	U		5 U	lu -		v	u	 	U	U

Industri-Plex, Woburn, MA Site Locations - Organic Surface Water Data

NEH, Inc.

Client Sample ID:		νĸ		RINSE BLA	NK		RINSE BLA	NK		RINSE BLA	NK A	1	RINSE BLA	NK B	T
	42547-2	<u> </u>	<u> </u>	42551-3	Ì		42562-3	. }		42563-9		 	42563-14		1
Sample Date:		Lab	DV	06/18/99	Lab	DV	06/21/99	Lab	DV	06/22/99	Lab	DV	06/23/99	Lab	DV
Units		Qual.	Qual.	jug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Quai.	Quar
Analyte-Semivolatile Organic Compoun															
EPA Method 8270C												1		1	
bis(2-Chloroethyl)ether		4 U	U		4 U	U		4 U	U	-	4 U	Ü	 	4 U	lu
Phenal		4 U	U	1	4 U	U	†	4 U	lu -	 -	4 U	† 	 -	4 U	u-
2-Chlorophenol		4 U	U	·	4 U	U	 	4 U	lu -	 	4 U	111		4 U	<u> u</u>
1,3-Dichlorobenzene		4 U	U		4 U	111	 	4 U	lu -		4 U	10 -	 	4 U	Ū
1,4-Dichlorobenzene		4 U	U	f	4 U	Ш	 	4 U	 0	 	4 U	 	 	4 U	U
1,2-Dichlorobenzene		4 U	U	 	4 U	lu	 	4 U	lu -	 	4 U	 	ļ	4 U	lu —
bis(2-chloroisopropyl)ether	·	4 U	U	†···	4 U	D -	 	4 U	lu u	 	4 U	10-	 	4)U	U
Hexachloroethane		4 U	u	 	4 U	U		4 U	u	 	4 U	li	 	4 U	10-
N-Nitroso-di-n-propylamine	F	4 U	U	 	4 U	10	 	4 U	lu -	1	4 U	υ ·	 	4 U	U -
Nitrobenzene		4 U	u	<u> </u>	4 U	U	 	4 U	Ū.	 	4;U	1 u	 	4 U	U
Isophorone			υ	<u> </u>	4 U	U	<u>†</u>	4 U	Ū		4 U	lu	 	4 U	lu
2-Nitrophenol		4 U	U		4:U	u –	 	4 U	u	 	4 U	l i	 	4 U	lu
2,4-Dimethylphenol		4 U	U	1	4 U	U	1	4 U	Ū	<u> </u>	4 U	lu		4 U	انا
bis(2-Chloroethoxy)methane		4 U	U	1	4 U	Ιυ	<u> </u>	4 U	lu ~	1	4 U	u -	 	4 U	l ū
2,4-Dichlorophenol		4 U	U	 -	4 U	u	 	4 U	U		4 U	lu -	 	4 U	U
1,2,4-Trichlorobenzene		4 U	u	† · · · · ·	4 U	lu -	 	4 U	U	 -	4 U	Tu Tu	 	4 U	U
Naphthalene		4 U	u		4 U	U	 	4 U	Ū	 	4 U	U	 	4 U	lu
Hexachlorobutadiene		4 U	ŲĴ	†	4 U	UJ	†	4 U	UJ	 	4 U	nn A	+	4 U	UJ
4-Chloro-3-methylpheпоl		4 U	u	†	4 U	U .	 	4 U	U	 	4 U	u -	 	4 U	U
Hexachlorocyclopentadiene	1	1 U	UJ	1	11 U	UJ		10 U	lu	 -	10 U	lu	 	11 U	l u
2,4,6-Trichlorophenol	<u> </u>	4 U	U		4 U	υ	<u> </u>	4 U	Ü	 	4 U	l ū	 	4 U	υ .
2-Chloronaphthalene		4 U	U		4 U	lu	<u> </u>	4 U	u -	 	4 U	lu	 	4 U	lu
Acenaphthylene		4 U	U	†	4 U	u	 	4 U	l u	<u> </u>	4:U	\u \u \u \u \u \u \u \u \u \u \u \u \u \	 	4 U	Ū
Dimethylphthalate		4 U	U	 	4 U	lu -	 	4 U	U	 	4 U	Ü	+	4 U	Tu-
2,6-Dinitrotoluene		4 U	U	 	4 U	U	1	4 U	U	 	4 U	U		4 U	lu-
Acenaphthene		4 U	Ū	 	4 U	lu		4 U	U		4 U	Tu-	 	4 U	lυ
2,4-Dinitrophenol		1 U	UJ	1	11 U	UJ	 	10 U	UJ	 	10 U	lnn In	 	11 U	lo ₁
2,4-Dinitrotoluene	 	410	U	† '	4 U	lu -	 	4 U	<u> </u>	}	4 U	U	 	4 U	U
4-Nitrophenol		1 0	U U	 	11 U	U	 	10 U	lu l	 	10,U	lu	 	11 U	lu -
Fluorene		4 U	U	 	4 U	U	 	4 U	U	 	4 ₁ U	U	 	4 U	U
4-Chlorophenyl-phenylether		4 U	U	†	4 U	U	 -	4 U	U	 	4 U	10	 	4 U	10-
Diethylphthalate		4 U	u	 	4 U	U	 	4 U	lu -	 	4 U	U	 	4 U	li l
4,6-Dinitro-2-methylphenal	·	1 U	UJ	 	11'U	רח	 	10 U	UJ	 	10 U	lo lo		11 U	UJ
n-Nitrosodiphenylamine		4 U	u	 	4 U	u	 	4 U	u	 	4 U	U		4 U	U
4-Bromophenyl-phenylether		4 U	Ū	 -	4 U	u	 	4 U	U	 		† "	 	 -	
Hexachlorobenzene		4 U	U		4 U	U	 	4 U	U	 	4 U	U	 	4 U	U U

U-Compound was non-detected. Associated value is sample-specific reporting limit. J-Result was estimated due to quality control exceedance. UJ-Compound was non-detected at estimated reporting limit.

NEH, Ir

	,		311	e Location		ganic		Vater I	Data						īN:
Client Sample ID:		K		RINSE BLA	NK		RINSE BLAI	NK		RINSE BLAN	VK A		RINSE BLAN	IK B	
Lab Sample ID:	·			42551-3		<u> </u>	42562-3	<u> </u>	<u>i</u>	42563-9			42563-14		
Sample Date:		Lab	DV	06/18/99	Lab	DV	06/21/99	Lab	DV	06/22/99	Lab	DV	06/23/99	Lab	DV
Units		Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.
Analyte-Semivolatile Organic Compoun					•										
EPA Method 8270C											1				
Pentachlorophenol	11	U	U	1	1 U	U	1	0 U	U	10	υ	U	11	U	U
Phenanthrene	4	U	υ		4 U	u		4 U	U		:.;-: 4	Ū		ı U	u
Anthracene	4	U	U		4 U	U		4 U	Ū	 	4 U	lu -		ŧ U	U
Di-n-butylphthalate	6				4 U	U	ļ	4 U	ĺυ	24	4		 	2 J	J
Fluoranthene	4	u	U		4 U	U	1	4 U	U	+	4 U	Tu -	· · · · · · · · · · · · · · · · · · ·	i U	U
Pyrene	4	U	U		4 U	U		4 Ų	U	 	4 U	u	 	ŧ U	Ū
Butylbenzylphthalate	4	U	U		4 U	U		4 U	U	·} ——————	4 U	lu		ŧ U	Ū
3,3'-Dichlorobenzidine	4	u	U		4 U	U		4 U	U		4 U	lu	 	ŧ U	u
Benzo[a]anthracene	4	υ	U		4 U	U	ļ	4 U	U	 	4 U	u	+	‡ U	u
Chrysene	4	U	U		4 U	u		4 U	Ų	f	4 U	lu		+	u
bis(2-Ethylhexyl)phthalate	4	U	U		4 U	U	·	4 U	U	· 	4 U	lu -		1 U	u
Di-n-octylphthalate	4	U	U		4 U	U	ļ	4 U	U	1	4 U	Ū		ı U	U
Benzo[b]fluoranthene	4	U	U		4 U	U		4 U	U		4 U	U		I U	U
Benzo(k)fluoranthene	4	U	Ú	1	4 U	U		4 U	U	-	4 U	Ū	·	۱ U	u
Benzo[a]pyrene	4	U	U		4 U	U		4 U	U	4	4 U	Ų		ı U	lu -
Indeno[1,2,3-cd]pyrene	4	U	U		4 U	U		4 U	U	1	\$ U	U		U	lυ
Dibenz(a.h)anthracene	4	u	U		4 U	U		4 U	U	4	4 U	U		U	U
Benzo[g,h,i]perylana	4	U	U		4 U	U		4 U	U	4	4 U	lu -	+	I U	lu
2-Methylphenol	4	U	U		4 U	U		4 U	U	4	4 U	lu		ιυ	U
4-Methylphenol	4	U	U		4 U	U		4 U	Ų	- 4	4 U	U	 	(U	Ū
4-Chloroaniline	4	U	U		4 U	v	-	4 U	U		4 U	Ū		i U	l u
2-Methylnaphthalene	4	U	U		4 U	U		4 U	U	· 	4 U	U	·	i U	lu
2,4,5-Trichlorophenol	11	U	U	1	1 U	U	<u> </u>	0 U	ĺυ	+	טע	u	+	ıυ	u
2-Nitroaniline	11	U	U	1	1.U	U	· · · · · · · · · · · · · · · · · · ·	0 U	U		Σί υ	u u	+ · · · · · · · · · · · · · · · · · · ·	IU	Ū
3-Nitroaniline	4	U	U		4.U	Ų	 	4 U	U	·	4 · U	lu		ŧ U	u -
Dibenzofuran	4	U	U		4 U	U		4 U	U		4.U	lu	 	ı U	\ <u>u</u>
4-Nitroaniline	11	U	U	1	1 U	U		0 U	U	+	D.U	Ū	 -	ı u	Ι <u>υ</u>
Carbazole	4	U	U	 	4 U	U		4 U	lu .	 	4 U	lu	+	I U	ļ

Industri-Plex, Woburn, MA Reference Locations - Organic Surface Water Data

validated 10/2/199 NEH, Inc.

				SIICE LUC	10113 -	. Orya	inic Suriac	e yvai	er Da	ta					'
Sample Location ID:	SD-01			SD-02			SD-02DUP			SD-03	ĺ		SD-03DEEF	>	1
	42574-3		<u> </u>	42574-1		I	42574-2			42551-1		1	42551-2		+
Date Sampled:	06/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	Īον
	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qu
Analyte-Semivolatile Organic Compoun	ids (SVOC)						Field Duplica	ite							
EPA_Method 8270C							1				<u> </u>				t
bis(2-Chloroethyl)ether	5	Ū	U		5 U	u		Ū	U	<u> </u>	4 U	U	<u> </u>	4 U	U
Phenol		s U	U		5 U	Ü	5	5 U	U		4 U	U	 	4 U	u
2-Chiorophenol		U	U		5 U	υ		5 Ù	U		4 U	U		4 U	Tu-
1,3-Dichlorobenzene		J.U	U		5 U	U		5 U	U	1	4 U	U	_	4 U	Ū
1,4-Dichlorobenzene		5 U	U		5 U	U		5 U	U	1	4 U	U	<u> </u>	4 U	Ū
1,2-Dichlorobenzene		U	U		5 U	U	+	 5∶U	lu	1	4 U	u -		4 U	ū
bis(2-chloroisopropyl)ether	·	U	U		5 U	U	 	5 U	U	 -	4 0	U -	<u> </u>	4 U	U
Hexachloroethane		5 U	u		5 U	Ū		5 U	U	†- 	4 U	lu -	 	4 U	U U
N-Nitroso-dì-n-propylamine	 	5 U	U		5 U	Ü	+ -	5 U	tu -		4 U	U	 	4 U	U
Nitrobenzene	;	5 U	U		5 U	U	 	5 U	U	1	4 U	Ū	1	4 U	U
Isophorone		5 U	U		5 U	U	· 	5 U	Ū	1	4 U	u	†	4 U	Ū
2-Nitrophenol	ļ	5 U	Jυ		5 U	Ų		5 U	U	†	4 U	Ü		4 U	u
2,4-Dimethylphenol	,	5 U	Ū		5 U	u		5 U	υ	1	4 U	ju -	 	4 U	u
bis(2-Chloroethoxy)methane	+- 	5 U	U		5 U	U		5 U	u		4 U	lu	 -	4 U	Ū
2,4-Dichlorophenol	+	5 U	U		5 U	u		5 U	U		4 U	Tu -		4:U	lū
1,2,4-Trichlorobenzene	+	5 U	U	1	5 U	u	 -	5 U	Ū	 	4 U	lu	 	4 U	Ιυ
Naphthalene		5 U	U		5 U	u		5 U	 	1	4 U	l u	 	4 U	ΙŪ
Hexachlorobutadiene	 -	5 U	UJ		5 U	UJ		5 U	กา	1	4 U	- Lu	 	4 U	Ü
4-Chloro-3-methylphenol		5 U	Ū		5 U	u U		5 U	U -	 	4 U	-lu	 	4 U	lu
Hexachlorocyclopentadiene	1;	3 U	Ü	 	13 U	u		3 U	U	 	11 U	UJ	 	11 U	UJ
2,4,6-Trichlorophenol	†	5 U	U		5 U	ū		5 U	Ū	†	4 U	U U	†	4 U	lu
2-Chloronaphthalene	1	5 U	U		5 U	U		5 U	Ū	 	4 U	lu -		4 U	٦
Acenaphthylene		5 U	U	1	5 U	Ų		5 U	υ ·	†	4 U	l u	1	4 U	U
Dimethylphthalate	 	5 U	U		5 U	U	1	5 U	U	1	4 U	U U	 	4 U	ΙŪ
2,6-Dinitrotoluene	+	5 U	U		5 U	U		5 U	Ū		4 U	J u	 	4 U	t
Acenaphthene	 	5 U	U	-	5 U	ū		5 U	U	 	4 U	ĺυ –	1	4 U	Ιυ
2,4-Dinitrophenol	 	3 U	IJ		13 U	UJ	+	3 U	UJ.	 	11 U	UJ		11 U	ŪJ
2,4-Dinitrotoluene		5 U	U		5 U	U		5 U	Tu .	†	4 U	U	 	4 U	U
4-Nitrophenol	+	3 U	u	 	13 U	U		3 U	U	 	11/0	u	 -	11 U	U
Fluorene	 	5 U	U	 	5 U	U	- +	5 U	U		4 U	U	-	4 U	Ŭ
4-Chlorophenyl-phenylether	+ 	5 U	U	 	5 U	υ		5 U	lu lu	 	4 U	U	 	4 U	- U
Diethylphthalate		5 U	u u		5 U	U		5 U	Ū	†	4 U	U	 	4 U	- lu
4,6-Dinitro-2-methylphenol	+	3 U	บุ	-	13 U	UJ		3 U	lnn Io	 	11 U	101	 	11 U	UJ
n-Nitrosodiphenylamine	+	5 U	U		5 U	U		5 U	u	 	4 U	U		4 U	U
4-Bromophenyl-phenylether		5 U	Ιυ -	 	5 U	U		5 U	U	+	4 U	-	 		- - -
Hexachlorobenzene	+	5 U	U -	+		+	·			 		U	 	4 U	U
	J	بال	lu -	<u> </u>	5 U	U		5 U	U		4 U	Įυ	I	4 U	U

U-Compound was non-detected. Associated value is sample-specific reporting limit. J-Result was estimated due to quality control exceedance. UJ-Compound was non-detected at estimated reporting limit.

			Ketere	ence Location	ns - Org	ani inac	ce Wat	er Da	ta					NI
Sample Location ID:	SD-01			SD-02		SD-02DUP		i	SD-03	1		SD-03DEEP		
Lab Sample ID:	42574-3			42574-1		42574-2			42551-1	1		42551-2	 -	i
Date Sampled:	06/21/99	Lab	DV	06/21/99 L	ab DV	06/21/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV
Units	ug/L	Qual.	Qual.	ug/L Q	ual. Qua	l. ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.
Analyte-Semivolatile Organic Co	mpounds (SVOC)					Field Duplic	ate		, <u></u>	1		1		
EPA Method 8270C	Ţ							1		1		<u> </u>	+	†
Pentachlorophenol	13	U	U	13 U	U	1	3 U	U	1.	Ų	u	11	ı U	U
Phenanthrene		U	U	5 U	U		5 U	U	† ·	ı U	u		I U	u
Anthracene		U	U	5 U	U		5 U	U		U	Ū		ı U	U
Di-n-butylphthalate		U	U	5 U			5 U	U	 	i.U	lu	 	I U	u
Fluoranthene		U	U	5 U	U	+	5 U	Ū	 	II U	U		I U	U
Pyrene		U	U	5 U	U	_+	5 U	u -	+	i u	lu		ı U	U
Butylbenzylphthalate	:	Ü	U	5 U	U		5 U	Tu -	+	U	u		i U	u
3,3'-Dichlorobenzidine		U	U	5 U			5 U	u	+	U	u -		1 U	u
Benzo[a]anthracene		U	U	5 U			5 U	Ü	 	i u	U		i U	U
Chrysene		U	υ	5 U			5 U	u -	 	ıU	u		1 U	Ū
bis(2-Ethylhexyl)phthalate		Ü	U	5 U	U		5 U	lu		ı U	u		3 J	<u> </u>
Di-n-octylphthalate	1 :	U	U	5 U	U		5 U	U	+	I _I U	u		ı U	Ū
Benzo[b]fluoranthene		U	U	5 U			5 U	Ū	·	IU	U	 	i U	U
Benzo(k)fluoranthene		U	Ū	5 U			5 U	Ü	 	L U	u		ı	u
Benzo(a)pyrene		Ü	Ū	5 U			5 U	u	 	iu	u	 	i U	u
Indeno[1,2,3-cd]pyrene		U	U	5 U		·~ 	5 U	U	+	ιυ	U	 	1 U	U
Dibenz[a,h]anthracene		U	Ū	5 U			5 U	u	 	ı u	u u		i U	u u
Benzo[g,h,i]perylene		U	U	5 _. U			5 U	u		ı U	lu -	 	U	U
2-Methylphenol		U	Ų	5 _. U			5 U	U	+	U	U	+	Į U	u -
4-Methylphenol		U	U	5 U	Ü		5 U	Ū	+	I U	U		I U	u
4-Chloroaniline		U	U	5 U	U		5 U	U		I U	U		ı u	u
2-Methylnaphthalene		U	U	5 U	U		5 U	U		 I U	lu		ŧ U	† <u>-</u>
2,4,5-Trichlorophenol	13	U	Ų	13 U	U	1	3 U	U	 	U	U		U	U
2-Nitroaniline	13	U	U	13 U	U		3 U	U		u	U	 	U	U
3-Nitroaniline		U	U	5 U	U		5 U	U		U	U	 	ŧ u	u
Dibenzofuran		U	U	5 U	U	 -	5 U	U	 	ΙŪ	U	}	1 U	u
4-Nitroaniline	13	U	U	13 U	U		3 Ų	Ū		U	u		ı u	Ū
Carbazote		U	Ü	5 U	U		5 U	Ū		ı u	Ū		1 U	U

14	CU.	100
1.4	EH,	HIE

			Refer	ence Locat	ions ·	· Orga
Sample Location ID:	SD-04	i i		SD-12	1	T -
Lab Sample ID:	42547-1	1		42547-3	† 	
Date Sampled:	06/17/1999	Lab	DV	06/17/1999	Lab	DV
Units	ug/L	Qual.	Qual.	ug/L	Qual.	Qual
Analyte-Semivolatile Organic Compour						1
EPA Method 8270C		1	1			
bis(2-Chloroethyl)ether	† · · · · · · · ·	į U	Ū		†U	U
Phenol	1	1 U	Tu -		\$!U	U
2-Chiorophenoi	1	ŧ U	Ū	+	ŧ.U	lu -
1,3-Dichlorobenzene	†	ı U	U		1 U	lu -
1,4-Dichlarobenzene		4 U	u	<u> </u>	‡ U	Ü
1,2-Dichlorobenzene		4 U	įυ-		4 U	U
bis(2-chloroisopropyl)ether	 	4 U	U	·	4 U	lu
Hexachloroethane	 	4 U	Ιΰ	+	4 U	10
N-Nitroso-di-n-propylamine	- 	4 U	Ū	 -	4 U	υ
Nitrobenzene	+	4 U	U		4 U	
Isophorone	 	4 U	U		4 U	U
2-Nitrophenol		4 U	υ		4 U	U
2,4-Dimethylphenol	 	4 U	Tu I	·	4!U	$\frac{1}{0}$
bis(2-Chloroethoxy)methane	 	4 U	Ü		4 U	U U
2.4-Dichlorophenol		4 U	U	+	4 U	Ju -
1,2,4-Trichlorobenzene		4,U	Ū		4 U	U
Naphthalene		4 U	U	1	4 U	-
Hexachlorobutadiene		4 U	ŪJ		4 U	nn A
4-Chloro-3-methylphenol		4 U	U		4 U	U
Hexachlorocyclopentadiene	11	U	UJ	1	υ	UJ
2,4,6-Trichlorophenol		4 U	U		4 U	U
2-Chłoronaphthalene		4 U	U		4 U	U
Acenaphthylene		4 U	U		4 U	U
Dimethylphthalate		4 U	U		4 U	U
2,6-Dinitrotoluene	,	4 U	U		4 i U	U
Acenaphthene	,	4 U	U		+ 4 ¡U	U
2,4-Dinitrophenol	1) U	UJ	11) Ų	ŲJ
2,4-Dinitrotoluene		4 U	U		4 U	U
4-Nitrophenol	11	טוֹט	υ	1	วเบ	U
Fluorene		4 U	Ū		4 U	Ū
4-Chlorophenyl-phenylether		4 U	Ū		4 U	j ū
Diethylphthalate		4 U	Ū	 -	4 U	U
4,6-Dinitro-2-methylphenol	10	טֿע	ĺΩΊ		olu -	UJ
n-Nitrosodiphenylamine		4 U	U		4 U	U
4-Bromophenyl-phenylether	+	1 U	U		1 U	tu
Hexachlorobenzene	 	','` ₩₩	Ū		1 0	

U-Compound was non-detected. Associated value is sample-specific reporting limit. J-Result was estimated due to quality control exceedance. UJ-Compound was non-detected at estimated reporting limy

Industri-Plex, Wobirm, MA Reference Locations - Organia Inface Water Data

		,	Zaiais	ence Locati	003 -	Org:
Sample Location ID	SD-04		1	SD-12	!	
Lab Sample ID:	42547-1		}	42547-3		
Date Sampled:	06/17/1999	Lab	DV	06/17/1999	Lab	DV
Units	ug/L	Qual.	Qual.	ug/L	Qual.	Qual
Analyte-Semivolatile Organic Compour		<u> </u>	l			
EPA Method 8270C						
Pentachlorophenol	10	U	U	10	U	U
Phenanthrene	· · · · · · · · · · · · · · · · · · ·	U	U		U	Ū
Anthracene	4	U	U	4	U	U
Di-n-butylphthalate	4	U	υ	4	U	U
Fluoranthene	4	U	U	4	U	U
Pyrene	4	U	U	4	υ	Ū
Butylbenzylphthalate	4	U	U	4	Ü	Ū
3,3'-Dichlorobenzidine	4	U	lυ	4	U	lυ
Benzo[a]anthracene	4	U	u		U	Ū
Chrysene	4	U	U	 -	υ	Ū
bis(2-Ethylhexyl)phthalate	4	U	U	4	U	Ū
Di-n-octylphthalate	4	U	U	4	U	U
Benzo(b)fluoranthene	4	U	u	. 4	U	U
Benzo(k)fluoranthene	4	U	lu	4	Ú	Ū
Benzo(a)pyrene	4	U	U	4	U	lu -
Indeno[1,2,3-cd]pyrene	4	U	lυ		U	lu
Dibenz[a,h]anthracene	4	U	U	1 4	U	lυ
Benzo(g,h,i)perylene	4	U	U	4	U	U
2-Methylphenal	4	U	U	4	U	lυ
4-Methylphenol	4	U	U	4	U	U
4-Chloroaniline	4	U	U	4	U	U
2-Methylnaphthalene	4	U	U	4	U	U
2,4,5-Trichlorophenol	10	Ų	U	10	U	U
2-Nitroaniline	10	U	U	10		Ū
3-Nitroaniline	4	Ų	Įu –		U	Ū
Dibenzofuran	4	Ų	U	4	υ	U
4-Nitroaniline	10	U	U	10	U	u
Carbazole	4	Ų	u		Ų	Ū

Client Sample ID:	SD-13	, - -	<u> </u>	SD-11			SD-10	1		SD-09	 		SD-08	·	
Lab Sample ID:	42547-4	1		42574-5	 	 	42574-4	 	<u> </u>	42575-2	 	 -	42575-1	 	
Sample Date:	06/17/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	Tov -	06/22/99	Lab	να	06/22/99	4	-
Units	µg/L	Qual.	Qual.	µg/L	Qual.	Qual.	µg/L		Qual.	00/22/33	 	Qual.		Lab Qual.	DV Qual.
Analyte-PCBs and Pesticides								1		 	Qua.	QDai.		Qual.	Quai.
EPA Methods 8082 and 8081A			<u> </u>			 		-	 	 	} -	 		-	
Aroclor 1016	0.044	U	U	0.043	U	lu	0.041	U	U	0.051	 	lu -	0.053	111	u
Aroclar 1221	0.044	U	U	0.043	U	U	0.041		U	0.051	-	lu	0.053		u
Aroclor 1232	0.044	U	U	0.043	Ų	U	0.041		U	0.051		U	0.053		U -
Aroclor 1242	0.044	U	lu	0.043	U	U	0.041		Ū	0.051	+	lu -	0.053	 -	U
Aroclor 1248	0.044	U	u	0.043	U	U	0.041		Ū	0.051		υ ·	0.053		lu –
Aroclor 1254	0.044	U	Ū	0.043	U	U	0.041	U	U	0.051		lu .	0.053		lu -
Aroclor 1260	0.044	U	υ	0.043	U	U	0.041	U	U	0.051	+	U	0.053		U
Alpha-BHC	0.0089	j 	lu —	0.0086	ļ. —	U	0.0000	 	ļ			 			
Gamma-BHC	0.0089		lu	0.0086		U	0.0082	-	U_	0.010	+	 U	0.010	-	U -
IBeta-BHC	0.0089		ιυ -	0.0086	_	U	0.0082		U	0.010	+	U_	0.010		U
Delta-BHC	0.0089	+	 -	0.0086	,	U	0.0082	+	U	0.010 0.010	+	U	0.010	-	U
Heptachlor	0.0089		lu .	0.0086		U	0.0082		U	0.010	+	ł — —	0.010		U
Aldrin	0.0089	-	lu	0.0086	 	lu	0.0082	+	Ü	0.010	+	U	0.010		U
Heptachlor Epoxide	0.0089		u	0.0086	 -	lu	0.0082	 	U	0.010		Ü	0.010		U -
Gamma Chiordane	0.0089		u	0.0086	 	U -	0.0082	+	u -	0.010		U	0.010	,	U
Alpha Chlordane	0.0089	·	u	0.0086		U	0.0082	+	U	0.010	 	U	0.010		U
Endosulfan I	0.0089	 	u -	0.0086		lu -	0.0082		U U	0.010		Ü -	0.010		U -
4, 4'-DDE	0.0089		i u	0.0086		Ū.	0.0082		U	0.010		U	0.010		 0 -
Dieldrin	0.0089	U	lυ	0.0086	U	u	0.0082		u	0.010	+	lu -	0.010	4·— —	U
Endrin	0.0089	U	U	0.0086		u	0.0082		u u	0.010		tů –	0.010		<u> </u>
4, 4'-DDD	0.0089	U	U	0.0086	U	Ū	0.0082	+	u	0.010	 	lu -	0.010	 	U
Endosulfan II	0.0089	U	υ	0.0086	U	U	0.0082		U	0.010	+	lu -	0.010	+	U
4, 4'-DDT	0.0089	U	U	0.0086	U	UJ	0.0082		UJ	0.010		<u>u</u>	0.010		UJ T
Endrin Aldehyde	0.0089	U	U	0.0086	U	U	0.0082	u	UJ	0.010	U	U	0.010		U
Endosulfan Sulfate	0.0089	U	U	0.0086	U	U	0.0082	U	U	0.010	U	U	0.010	 -	U
Methoxychlor	0.044	U	U	0.043	U	UJ	0.041	U	UJ	0.051	U	UJ	0.053	U	UJ
Endrin Ketone	0.0089	U	U	0.0086	U	UJ	0.0082	u	IJ	0.010	IJ	UJ	0.010	+	UJ
Toxaphene	0.089	U	U	0.086	U	Ų	0.082	U	U	0.10	U	ΙŪ	0.10	U	υ-

U-Compound was non-detected. Associated value is the sample-specific reporting limit. J-Result was estimated due to quality control exceedance. UJ-Compound was non-detected at estimated reporting limit.

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Industri-Plex, Woburt, MA Site Locations - Organic Surface Water Data

Validated 10/27/99 NEH, Inc.

Client Sample ID:	SD-07DEEP			SD-07SHALLOW	\	1	SD-06			SD-05DEEP			SD-05SHALLOW	
Lab Sample ID:	42551-6			42551-7			42551-5			42551-8			42551-9	
Sample Date:	06/18/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV	06/18/99 La	o DV
Units	µg/L	Qual.	Qual.	µg/L	Qual.	Qual.	µg/L	Qual.	Qual.	µg/L	Qual.	Qual.	µg/L Qu	al. Qual
Analyte-PCBs and Pesticides														
EPA Methods 8082 and 8081A														
Araclor 1016	0.042	U	U	0.042	U	U	0.041	U	U	0.044	U	U	0.044 U	U
Araclar 1221	0.042	U	υ	0.042	U	U	0.041	U	U	0.044	U	U	0.044 U	U
Aroclor 1232	0.042	U	U	0.042	U	U	0.041	U	U	0.044	U	U	0.044 U	Ū
Aroclor 1242	0.042	U	U	0.042	U	U	0.041	U	U	0.044		U	0.044 ป	U
Aroclar 1248	0.042	U	U	0.042	U	Ü	0.041	U	U	0.044	U	U	0.044 U	Ü
Aroclor 1254	0.042	Ų	U	0.042	U	U	0.041	Ų	U	0.044	U	U	0.044 U	U
Areclar 1260	0.042	Ų	U	0.042	U	u	0.041		U	0.044		U	0.044 U	Ū
Alpha-BHC	0.0083	U	υJ	0.0083	U	บา	0.0082	U	υJ	0.0089	U	ŲĴ	0.0088 U	UJ
Gamma-BHC	0.0083	U	UJ	0.0083	U	IJ	0.0082	Ü	บา	0.0089	U	υJ	0.0088 U	ÚJ
Beta-BHC	0.0083	U	Ų	0.0083	u_	U	0.0082	U	Ū	0.0089	U	U	0.0088 U	U
Delta-BHC	0.0083	U	U	0.0083	Ų	Ų	0.0082	U	U	0.0089	U	U	0.0088 U	U
Heptachlor	0.0083	Ų	U	0.0083	U	U	0.0082	U	U	0.0089	U	υ	0.0088 U	U
Aldrin	0.0083	U	U	0.0083	U	U	0.0082	U	U	0.0089	U	u	0.0088 U	U
Heptachlor Epoxide	0.0083	U	U	0.0083	U	U	0.0082	U	U	0.0089	U	U	0.0088 U	U
Gamma Chlordane	0.0083	U	U	0.0083	U	U	0.0082	U	Ū	0.0089	U	U	0.0088 U	Ú
Alpha Chlordane	0.0083	U	υ	0.0083	U	υ	0.0082	U	U	0.0089	U	U	0.0088 U	Ú
Endosulfan I	0.0083	U	U	0.0083	U	Ų	0.0082	U	Ū	0.0089	U	Ū	0.0088 U	ĺυ
4, 4'-DDE	0.0083	U	U	0.0083	U	U	0.0082	V	U	0.0089	U	υ	0.0088 U	U
Dieldrin	0.0083	U	U	0.0083	U	U	0.0082	U	U	0.0089	U	U	0.0088 U	U
Endrin	0.0083	U	U_	0.0083	U	U	0.0082	U	U	0.0089	U	U	0.0088 U	U
4, 4'-DDD	0.0083	U	U	0.0083	U	U	0.0082	U	U	0.0089	U	U	0.0088 U	U
Endosulfan II	0.0083		U	0.0083	U	U	0.0082	U	U	0.0089	υ	U	0.0088 U	U
4, 4'-DDT	0.0083		U	0.0083		U	0.0082	U	U	0.0089	U	U .	0.0088 U	U
Endrin Aldehyde	0.0083		ПĴ	0.0083	U	γJ	0.0082	U	υJ	0.0089	U	UJ	0.0088 U	ÚJ
Endosulfan Sulfate	0.0083	u	U	0.0083	Ų	Ų	0.0082	U	u	0.0089	U	U	0.0088 U	U
Methoxychlor	0.042		ŪĴ	0.042	U	ŲΊ	0.041	U	ΠΊ	0.044	U	UJ	0.044 U	UJ
Endrin Ketone	0.0083	U	UJ	0.0083	U	UJ	0.0082	U	UJ	0.0089	Ų	UJ	0.0088 U	IJ
Toxaphene	0.083	U	U	0.083	U	U	0.082	U	U	0.089	Ų	Ų	0.088 U	U

Client Sample ID:	RINSE BLAN	K				RINSE BLAN	ĸ		RINSE BLAN	K		RINSE BLAN			
Lab Sample ID:	42547-2	1	 	42551-3	i	† -	42562-3		 	42563-9		 	42563-14		 -
Sample Date:	06/17/99	Lab	DV	06/18/99	Lab	DV	06/21/99	Lab	DV	06/22/99	Lab	DV	06/23/99	Lab	DV
Units	µg/L	Qual.	Qual.	μg/L	Quai.	Qual.			Qual.	µg/L	Qual.	 	µg/L	Qual.	Qual.
Analyte-PCBs and Pesticides					-]		-	Ha, c	Quai.	Quar.
EPA Methods 8082 and 8081A		l										1			
Aroclor 1016	0.047	U	U	0.048	U	Ü	0.040	U	Ü	0.040		u	0.043		lu
Aroclor 1221	0.047	U	υ	0.048	U	U	0.040	U	u	0.040	<u> </u>	lu	0.043		u
Aroclor 1232	0.047	U	U	0.048	iU	U	0.040		u	0.040		Ū	0.043		U -
Aroclor 1242	0.047	U	U	0.048		υ	0.040		U	0.040	——	u u	0.043		lu
Aroclor 1248	0.047	U	U	0.048	U	U	0.040	U	U	0.040	-	tu —	0.043		U
Aroclar 1254	0.047	U	U	0.048	U	u	0.040	/	U	0.040	+=	u -	0.043		tü
Aroclor 1260	0.047	U	U	0.048	U	U	0.040	 	U	0.040		Ū	0.043		ŭ
Alpha-BHC	0.0094	U	u	0.0095	<u> </u>	IJ	0.0080	<u> </u>	u	0.0081	11	u	0.0087	-	U
Gamma-BHC	0.0094	U	u u	0.0095		UJ	0.0080		u	0.0081	┿-	υ -	0.0087		U
Beta-BHC	0.0094	 	Ū	0.0095		u	0.0080	_	U	0.0081	 	U	0.0087		1
Delta-BHC	0.0094		U	0.0095		U	0.0080	 	ů -	0.0081		lu —	0.0087	· ·	U
Heptachlor	0.0094	U	U	0.0095	 	U	0.0080		u	0.0081	↓ ⁻──	Ü	0.0087	+	U
Aldrin	0.0094	U	U	0.0095		U	0.0080		Ū	0.0081	<u> </u>	u	0.0087	-	lu -
Heptachlor Epoxide	0.0094	U	U	0.0095		U	0.0080		ŭ.	0.0081	<u> </u>	lu -	0.0087		u
Gamma Chlordane	0.0094	U	U	0.0095	U	U	0.0080	Ū	u	0.0081		lu	0.0087	+	u
Alpha Chiordane	0.0094	U	U	0.0095	U	υ	0.0080	Ū	υ	0.0081	-	U	0.0087	-	U
Endosulfan I	0.0094	U	U	0.0095	U	υ	0.0080	U	Ū	0.0081		ŭ	0.0087	<u> </u>	Ü
4, 4'-DDE	0.0094	U	U	0.0095	U	U	0.0080	U	U	0.0081	U	U	0.0087	U	Ū
Dieldrin	0.0094	U	υ	0.0095	U	U	0.0080	U	U	0.0081	U	u	0.0087	U	U
Endrin	0.0094	U	U	0.0095	U	U	0.0080	U	U	0.0081	U	U	0.0087	U	Ū
4, 4'-DDD	0.0094	U	U	0.0095	Ü	U	0.0080	Ū	U	0.0081	U	U	0.0087	U	Ū
Endosulfan II	0.0094	U	U	0.0095	U	U	0.0080	U	U	0.0081		U	0.0087		Tu -
4, 4'-DDT	0.0094	U	U	0.0095	U	U	0.0080	U	ΟJ	0.0081		UJ	0.0087		ΩJ
Endrin Aldehyde	0.0094	U	U	0.0095	U	UJ	0.0080	u	UJ	0.0081		UJ	0.0087		UJ
Endosulfan Sulfate	0.0094	U	U	0.0095	U	U	0.0080	U	U	0.0081		U	0.0087		lu -
Methoxychlor	0.047	U	U	0.048	U	เกา	0.040	U	UJ	0.040		UJ	0.043		UJ
Endrin Ketone	0.0094	U	U	0.0095	Ų	ŲĴ	0.0080	U	UJ	0.0081	υ	ŲĴ	0.0087	U	UJ
Toxaphene	0.094	U	Ų	0.095	U	υ	0.080	Ü	U	0.081	U	u	0.087	u	U

U-Compound was non-detected. Associated value is the sample-specific reporting limit. J-Result was estimated due to quality control exceedance. UJ-Compound was non-detected at estimated reporting limit.

REFERENCE_ Page 1 of 2 surfacewater.xls

Industri-Plex, Wob..., MA Reference Locations - Organic Surface Water Data

Validated 10/27/๖๖ NEH, Inc.

Sample Location ID:	SD-01			SO-02			SD-02DUP		SD-03		 	SD-03DEEP	\	
Lab Sample ID:	42574-3			42574-1		+	42574-2		42551-1			42551-2	<u> </u>	
Date Sampled:	06/21/99	Lab	עם	06/21/99	Lab	DV	06/21/99	Lab	06/18/99	Lab	DV	06/18/99	Lab	DV
Units	µg/L	Qual.	Qual.	µg/L	Qual.	Qual.	μg/L	Qual.	μg/L	Qual.	Qual.	µg/L	Qual.	Qual.
Analyte-PCBs and Pesticides							Field Duplicat	8						
EPA Methods 8082 and 8081A														
Aroclor 1016	0.045	Ų	U	0.048	U	U	0.046	Ú	0.048	U	U	0.042	U	u
Aroclor 1221	0.045	U	U	0.048	U	U	0.046	u	0.048	U	U	0.042		lυ
Aroclar 1232	0.045	U	u	0.048	Ų	U	0.046	U	0.048	Ü	U	0.042		U
Aroclor 1242	0.045	U	U	0.048	U	U	0.046	U	0.048	U	U	0.042		lu -
Aroclor 1248	0.045	U	U	0.048	U	U	0.046	U	0.048		U	0.042		Ιυ
Aroclor 1254	0.045	U	U	0.048	U	U	0.046	U	0.048	U	Ü	0.042		u
Aroclor 1260	0.045	υ	U	0.048	U	U	0.046	ų	0.048		U	0.042		Ū
Alpha-BHC	0.0091	1	 	0.0005		 				į.	<u> </u>		_	ļ
Gamma-BHC	0.0091	+	<u> U</u>	0.0095		U	0.0092		0.0095	-	UJ	0.0084		UJ
Beta-BHC	0.0091		U	0.0095 0.0095		U	0.0092		0.0095		UJ	0.0084		m
Delta-BHC	0.0091		U	 		U	0.0092	 	0.0095		U	0.0084		U
Heptachlor	0.0091		U	0.0095 0.0095		U	0.0092	+	0.0095		U	0.0084		U
Aldrin	0.0091		U -	0.0095		U	0.0092	-	0.0095		UJ			<u>u</u>
Heptachlor Epoxide	0.0091		 	0.0095		u	0.0092		0.0095		U	0.0084		U
Gamma Chlordane	0.0091	+	U -	0.0095	}	U	0.0092	+	0.0095		U	0.0084		U
Alpha Chiordane	0.0091		 	0.0095		U	0.0092		0.0095	·	υ	0.0084		<u> U</u>
Endosulfan i	0.0091	·	 	0.0095		U	0.0092		0.0095 0.0095		U	0.0084		U
4. 4'-DDE	0.0091		υ –	0.0095		U -	0.0092	+	0.0095		U	0.0084		
Dieldrin	0.0091	·	U	0.0095		Ū	0.0092		0.0095		U	0.0084		lu l
Endrin	0.0091		u	0.0095		lu	0.0092		0.0095	, 	u	0.0084		lu
4, 4'-DDD	0.0091		lu	0.0095		u	0.0092		0.0095		u	0.0084		U -
Endosulfan II	0.0091		Ū	0.0095		u -	0.0092		0.0095		 	0.0084		lu
4, 4'-DDT	0.0091		luj	0.0095		וח	0.0092		0.0095		u -	0.0084		u .
Endrin Aldehyde	0.0091		UJ	0.0095		UJ	0.0092		0.0095		UJ	0.0084		lui I
Endosulfan Sulfate	0.0091		u	0.0095		U	0.0092	-	0.0095		U	0.0084		U
Methoxychiar	0.045	-	UJ	0.048	<u> </u>	UJ	0.046		0.048		נט	0.042		lu1
Endrin Ketone	0.0091	 -	UJ	0.0095		UJ	0.0092		0.0095		UJ	0.0084		UJ
Toxaphene	0.091		u	0.095		u	0.092		0.095		u	0.084		U U

industri-Plex, Woburn, MA Reference Locations - Organic Surface Water Data

Sample Location ID:	SD-04			SD-12		
Lab Sample ID:	42547-1			42547-3	ļ	
Date Sampled:	06/17/99	Lab	DV	06/17/99	Lab	DV
Units	µg/L	Qual.	Qual.	µg/L	Qual.	Qual.
Analyte-PCBs and Pesticides						
EPA Methods 8082 and 8081A						
Aroctor 1016	0.051	U	U	0.042	U	U
Arociar 1221	0.051	U	U	0.042	U	U
Areclor 1232	0.051	U	u	0.042	U	U
Aroclor 1242	0.051	U	U	0.042	U	U
Aroclor 1248	0.051	U	U	0.042	U	υ
Aroclor 1254	0.051	U	U	0.042	u	U
Aroclor 1260	0.051	U	U	0.042	U	U
		<u> </u>				
Alpha-BHC	0.010	U	U	0.0083	U	U
Gamma-BHC	0.010	U	U	0.0083	U	U
Beta-BHC	0.010	U	U	0.0083	U	U
Delta-BHC	0.010	U	υ	0.0083	U	U
Heptachlor	0.010	U	<u>u</u>	0.0083	U	U
Aldrin	0.010	U	U	0.0083	U	U
Heptachlor Epoxide	0.010	U	U	0.0083	U	U
Gamma Chlordane	0.010	U	U	0.0083	Ų	U
Alpha Chlordane	0.010		U	0.0083	U	U
Engosulfan I	0.010	U	U	0.0083	·	Ų
4, 4'-DDE	0.010	U	U	0.0083	U	Ų
Dieldrin	0.010	 	U	0.0083	U	U
Endrin	0.010	U	U	0.0083	U	U
4, 4'-DDD	0.010	U	U	0.0083	u	U
Endosulfan II	0.010	U	Ų	0.0083	U	U
4, 4'-DDT	0.010	U	U	0.0083	U	Ų
Endrin Aldehyde	0.010	U	U	0.0083	U	U
Endosulfan Sulfate	0.010	U	U	0.0083	U	U
Methoxychlor	0.051	U_	U	0.042	u	U
Endrin Ketone	0.010	U	U	0.0083	U	Ü
Toxaphene	0.10	U	U	0.083	U	U

Industri - Plex, Woburn, MA 8260B Data Usability Review

IIIA. Review of Volatile Organic Data

8260B Data Usability Review VDC - Suface Water

1. Holding Times

Comments:

Holding times and QC association with the samples are reviewed to ensure the accuracy of the reported results. The table on the following page (Table 1a) was completed to document the holding times and QC association.

Review the Volatile Organic Analysis Data Sheet.

Were the holding time requirements (surface waters analyzed within 14 days; and sediments analyzed within 7 and 14 days of sampling, for low-level and high-level preservation) met for each sample? Yes/No. If no, list below the affected samples and the number of days outside of holding time.

Action: If the holding times were slightly exceeded, estimate (J and UJ) positive and non-detect results. If the holding times were grossly exceeded (more than twice the allowed holding time), professional judgment should be used to determine the action necessary. Evaluation of screening, undiluted and dilution analyses, if available, should be made to determine the impact of the holding time violation on the data quality (e.g., whether or not positive values are estimated (J) and whether non-detected values should be estimated (UJ) or rejected (R)).

Sumples received y collected 6/21/99 - COC

Sumples received y collected 6/21/99 - COC

Sumples collected in the summer - sent via courses to lab

immediately after collection (same-day).

Apparently, Mamples didnot have a charce

to cool-down completely upon beseight at lab

No Action taken.

Table 1a. Holding Time and Associated QC Table

Sample Matrix: Water 17 Waters + 2 ms/msb + 1 TB

Sampled	Ri	ield lank		ethod* Blank		¥ LCS	MS/MSD		te/Time alyzed
					ŧ			P.374	
	100	4 2551-	YOU	<u>-L/1</u>	7))- <u>0) ((0/#49</u>	200	03:45
				,				2000	04:12
			Bio	,2402	QIO	62901		2.52	
			ļ	<u> </u>				1. Sa	
-								N (a)	01:25
								6130	01:55
6/18 15:30								6130	02:25
6/18 16:30								6 30	02:55
6 18 16:30								6 (30	03:25
6118 17:30								6(30	03:54
6/18 17:30			1					€ 30	04:24
6/21/99			1310	63002	_			6130	19:24
6/21	[_	010	63002		6130	19:55
6/21				 	ļ	[]		6130	Z0:24
6 21	}	.,		↓				6/30	20:54
6/21				<u>. </u>		}		6 30	21:24
6/22/99			310	13002			\	C 30	21:53
6 22	<u>\</u>	<u> </u>		<u>/</u>			<u> </u>	6 30	22,23
					 				
					<u> </u>				
					<u> </u>		· · · · · · · · · · · · · · · · · · ·		
]			
							· · · ·		
	6/17/99 13:18 6/17/99 13:18 6/17/99 13:18 6/18 15:30 6/18 10:30 6/18 10:30 6/18 15:30	6 17 99 11:30 TB 6 6 17 99 13:18 6 17 15:30 6 18 9:30 6 18 10:30 6 18 10:30 6 18 15:30 6 18 16:30 6 18 17:30 6 18 17:30 6 21 6 21 6 21 6 21	6 17 99 11:30 TB 6 18 6 17 15:30 6 18 15:30 6 18 10:00	6 17 99 13:30 TB 6 18 B100 G117 15:30 B100 G118 10:30 B100 G118 10:30 G118 15:30 G118 15:30 G118 17:30 6 17 99 13:30 TB 6 18 VBCF0 6 17 15:30 H2551- 6 18 15:30 B1062902 6 18 10:30 6 18 15:30	6 17 99 13:30 TB G 18 VRLEOI QI 6 17 15:30 H2551- 6 18 9:30 B1062902 QIO 6 18 10:30 QIO 6 18 10:30 6 18 15:30 6 18 16:30 6 18 17:30 6 18 17:30 6 21 6 21 6 21 6 21 6 21 6 21 6 21 6 21 6 21 6 21	6 17 99 13:30 TB G 18 B1062804 Q1062803 G117 99 13:18 H2551- D1062804 Q1062804 G117 99 G118 6/17/99 11:30 TB 6/18 18:06 2804 Q1062803 50-03 ms/msp 6/17/99 13:18 17:30 6/18 9:30 6/18 10:30 6/18 10:30 6/18 15:30 6/18 16:30 6/18 17:30 6/18 18:30 6/18 18:30 6/18 18:30 6/18 18:30 6/18 18:30 6/18 18:30 6/18 18:30 6/18 18:30 6/18 18:30 6/18 18:30 6/18 18:30 6/18 18:30 6/1	C		

^{*} Lab Called all mBs "VBLKOI" + LCS as VBLKOIMS" + "VBLKOIMSD" - Therefore, Lab Sargh ID used to distinguish these QC Sargh.

GC/MS Instrument Performance Check

The BFB instrument performance checks (tunes) are reviewed to assess the accuracy and sensitivity of the results relative to instrument performance.

Review the tune summaries for BFB

Comments:

Were all Method 8260B defined mass calibration and ion abundance criteria met for the BFB analyses? Yes No. If no, list below the tune and affected samples.

Review the raw data for one time. Did the laboratory obtain the BFB mass spectrum in a straight-forward manner (e.g., average of three scans centered across the BFB peak with background subtraction from a scan within 20 scans prior to the BFB scan)? Yes/No. If no, list below the method used to obtain the mass spectrum and the affected samples.

Were all samples analyzed within 12 hours of an acceptable tune? Vesy No. If no, list below the affected samples.

Action: If the mass assignment criteria were not met (e.g., base peak assigned to m/z 96 instead of m/z 95), reject (R) all associated data. If the ion abundance criteria were not met, sound technical judgment should be used in evaluating whether or not the data require estimation (U and UJ) or rejection (R) (e.g., the criteria requirements for the m/z 95/96, 174/175, 174/176 and 176/177 ratios are most important for proper tune while the relative abundances for m/z 50 and 75 are of lesser importance.)

Singh Scan, with no backgrand convection, wed to evaluate
BFB - OK pu 82608. Form 5's have latest CLP SOW
Tuning Criteria: however, van door da True de instruct
hunte 82608 conteria - All times mit criteria peven
the to the Form 5's have culture that is different
though the Form 5's have criterin that is different.

3. Initial Calibration

The initial calibration data are reviewed to determine if the standards were compliant with the method protocols.

Review the Initial Calibration Data Summary. Check and recalculate the RRFs, RRF and %RSD for at least one volatile analyte across the ICAL. Does the RRF and %RSD check back to the raw data? Yes No. Were the RRFs for all analytes in the standard all greater than or equal to 0.05? Yes No.

Were at least five concentration levels of each compound analyzed during the initial calibration? Yes No Were all calibration standards analyzed within 12 hours of BFB tune? Yes No

Was the lowest initial calibration standard at a concentration equivalent to the sample-specific reporting limit (Yes) No

Were retention times for each target analyte stable across the calibration (i.e., minimum drift) (Yes)/ No

Did the initial calibration meet %RSD criteria of \leq 30% for all analytes (surrogates and targets) across the calibration range? Yes (NO) - \leq_{LL} page MA - VOA

Did the initial calibrations meet %RSD criteria of $\leq 15\%$ for target analytes and surrogates across the calibration range? Yes /No If no, was a calibration curve used for quantitation of results and was the correlation coefficient for the curve ≥ 0.99 ? Yes /No Was the curve forced through the origin? Yes / No If no, list below all the affected samples. All analytes 90250 \leq 15% except as noted on 4n-vo A

Action: If the %RSD >30% and average RRF \geq 0.05, qualify positive and non-detected results as estimated (J and UJ). If the %RSD >30% and average RRF <0.05 estimate positive results (J) and reject non-detected results (R). If the %RSD \leq 30% and average RRF <0.05 estimate positive results (J) and reject non-detected results (R). Sound technical judgment should be used in qualification of the data. The results for each sample associated with ICAL should be evaluated to determine if a result reported would be impacted by the mis-calibration.

Comments:

ICAL Check: Compound Checked Benzie

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Avg. RRF	%RSD
Concentration	2000	Speb	10 996	Supph	LUDPPB	200 000		
Response Cpd	51722	133361	281845	1513148	2888418	5706932		
Conc, IS	50 ppb	50	50	50	50	50		3-5-3-2
Response IS	115812	115561	114191	113974	114368	112378		
RRF	11.165	11,540	12.341	13.276	12.628	12.696	12.274	6.4

* All analytis except Acetrant Methylan Chloids vun lawest at Zppb-Acetran Micle lavest ICAL = 5 ppts

Additional Notes: ICAL - 8260B Continued	
Brumanothan 9, RSD = 38.29.	
Methylese Chloride 90 RSD = 30.890	
Methylae Chloide 70 RSD = 30.890 All other target and Surregate ToRSDC	~ 30 %
For Bromomethan, eliminating the highest standing in 90 RSD = 28.1%.	
For Muthyland Chlorida, eliminating The lawset resulted in 90RSD = 19.190	student (Sppb)
None of The singles reported positive results of Bromondethans or methylase chloride.	
Action: Board on Region I DV quidos the results for Mathylane Chicial in all Sa been qualified as estimated (UI) du in quantitation at the larest ICAL conce	non-ditected
in qualified as estimated (UI) du in qualification at the last ICAL conce	mtration (PL).
No action taken to qualify Bromontha quantitation dwn at the RL we shan I	non-deterts since be acceptable.

4. Continuing Calibration Check

The continuing calibration data are reviewed to determine if the standards were contractually compliant.

Review the Continuing Calibrations and Summaries. Check and recalculate the RRF and %Difference (%D) for at least one of the target volatile compounds in one of the CCALs. Does the RRF and %D check back to the raw data? Yes No. Were the RRFs for all analytes in the standard all ≥ 0.05 Yes Y

Was a continuing calibration check performed every 12 hours following tuning verification of the instrument? (Yes) No. If no, list below all the affected samples.

Were the target analytes recovered within the expected retention time window based upon the initial calibration (i.e., drift of instrument was acceptable)? Yes No.

Did the continuing calibrations meet 8260B criteria for verification of %D $\leq \pm 25$ %? Yes (No) If no, list below the outliers and the affected samples.

Action: If the %D > \pm 25% and the CCAL RRF \geq 0.05, estimate positive and non-detected results (J and UI) for samples analyzed following this standard for the compound(s) that was outside of calibration. If the RRF <0.05 qualify positive results as estimated (J) and reject (R) non-detected results as unusable.

Comments:

613019A@ 15:54

CCAL Check: Standard ID C1063001.D : Compound Checked 1010000

Responses	RRF	avg. RRF ICAL	% Difference
Cpd: 712215	0.5425	0.501	-8.3%
IS: 1312756		ere Commission (product)	

CCAL 6/29 @ 00:13, Lab FIL 10 C1062804. O. Chloromethan 32.5900 and 5D12 and SD:13 have been qualified as estimated (UT) due to CCAL Results.

CCAL 6/29@ 18:20 missing from data package. Resubstitue 092999 Volation issued to obtain (see page 3A)

CCAL 6/30@ 15:54 Lub File ID C1063001.0, Bromomethan 900 = -54.6%; Chloroethane 900 = -26.5%; Carbon Disulfide 900 = -28.590 => Name of Thec Congando were detected in Sangles

+ Action: For songles 50-2, SD-2 Dup, SD-01, SD-10, SD-11, SD-8 and SD-9, The results for Bromomethane, (5-VOA) Chloroethan, New Environmental Horizons, Inc.

Additional Notes:
Response to resubmittal received alraga via fox from lab-
Response to resubmittal received alzalaa via fox from lab-
CCAL 6/20 Bromomethan - 37.4900 - All others = ±2530. All RRFs > 0.05.
* Action: Bromomethone not detected in any surger => results (non-detected) qualified as estimated (UT) for Surger 50-03; 50-03 Deep; 50-06, 50-07 Deep, 50-07 Shalland, 50-05 Deep + 50-05 Shalland Trip Blak

5. Laboratory and Trip Blank Results

Laboratory and trip blank results are reviewed to assess the presence of contaminants, which affect the accuracy and sensitivity of the results. See Table 1a. where the Holding Time and Associated QC Table was completed for the samples within this SDG.

Was a Trip Blank associated with each sampling event for volatiles? Yes No If no, list below affected samples. Only 1 TB from 6/18 - Sampling mistrake which was subsequently additioned. Was each sample analysis associated with the appropriate method blank, ie., correct matrix, correct matrix level, same batch? (Yes) No. If no, list below affected samples.

Review the reporting forms for each method and trip blank. Were any target compounds in the method blanks detected at concentrations above the Reporting Limit (RL)? Yes / No. If yes, were methylene chloride, acetone or 2-butanone the only compounds reported above the RL? Yes / No. If yes, was methylene chloride < 2.5 times the RL and 2-butanone and acetone < 5 times the RL? Yes / No

Action: - Blanks should not contain contaminants above the RL except for methylene chloride, acetone and 2-butanone which must not be present above 2.5-5 times the RL (see above). The Blank Action Level is defined as five times the highest level seen in any of the matrix-matched blanks associated with this SDG, except if methylene chloride, acetone or 2-butanone are present, in which case the Blank action is ten times the highest level observed for these compounds in any matrix-matched blank. The following actions should be taken if conditions warrant:

- 1. If the blank is not matrix matched, qualify all sample data, for the contaminant associated with this blank, with BB, TB or EB, as appropriate.
- If the reported result in a sample is below the reporting limit (sample < RL) and if a matrix-matched blank contains a result above the quantitation limit (blank > RL), the result in the sample should be negated (U) and raised to the sample-specific RL for that sample
- 3. If the sample result is between the reporting limit and the blank Action Level (RL < sample < Action Level), the result for the sample is negated (U) at the level found in the sample. Based on the level of contamination suspected in the sample, the reporting limit may be elevated. Professional judgment will be used in assessing the action needed.</p>
- 4. If the sample result is greater than the RL and the blank Action Level, no action is taken.

Comments:

Blanks evaluated: Trip Black 6/18; VBLKO1 B1062804; VBLKO1 B1062902 + VBLKO1 B1063002

Highest Blank: TB618 Action 5J, Chloroforn 1J; VBLKO1 B1062902 3J methylace Choide Action taken: No Scargle report Methylace Choide = No Action: Acethe Black Action = 50 Mg/L
Sample ID Compound Reported Result Result based on Blank Action

Sample ID	Compound	Reported Result	Result based on Blank Action
50-06	Acetre	ZMG/L (J)	545/L W
80-07 Deep	Acetre	5491L (J)	5 U
SD.OS Streller	Acetra	43	5 u
50-02 Dup	Acetra	3JB	5 U
50-09	Acethi	4JB	5 U

Additional Notes:
Note: Method Bluk Associated with TB 6/18 analysis
did not show Acetha or Chloroform => TB 6/18 resulte
were reported without Black Action.
Acetra reported at Truce Concontrations in 5 Samples
ne partitional M. Dan TI William Circle to
The Actions for blank
action levels are anot taken as Trip Blanks.
the Aceth reporting Limit. Actions for blank action levels are anot taken por Trip Blanks. 8 to qualify full for solver
0
The 5 rensate "blanks are associated with
the sederent Samples.)

Surrogate Spike Recoveries

The surrogate spike recoveries are reviewed to assess the accuracy of the results relative to laboratory performance and specific sample matrix.

Review the Surrogate Recovery information for each field and quality control sample. For one sample, verify that the recoveries reported correspond to the raw data and that the recovery calculation was done properly. Were the recovery data reported properly? Yes No.

Were the surrogate recoveries within QAPP defined and method-generated accuracy limits Yes No. If no, were the affected samples reanalyzed? Yes / No. List below the affected samples.

Action - If one volatile surrogate recovery exceeds the upper limit, estimate (J) positive due to a potential high bias of the results; no action is required for non-detect results. If one volatile surrogate recovery is below the lower accuracy limit but above 10% recovery, estimate (J and UJ) the positive and non-detect results due to a potential low bias in the results. If any surrogate recovery is below 10%, reject (R) non-detect results and estimate positive results (J) due to potential false negatives and low bias in the results, respectively.. List below the affected samples and required actions.

Comments:

Lab used different Surrogates than given in QAPP (OK by Method 82608)-
Lab used Tolume-dr. Dibromoflumomethan & 4-Bronoflumoben gene
QAPP - Towlere-dx, 1,2-Dichboethne-dx : 4-Branoflumobuyine >>
2 Surregate the Som, I different. QC limits were lab
generated (as required by Method 8260B) and were actually tighter than limits in OMPP.
Dibrana fluoramethane in Sanda 42551-5 (SD-OG) checked from Raw
to fibre - 90 lic calculated Correctly [Cmc. DFm = 353235 × 50 = 50.91 M/L; 50 M/L spile = 70 Proc 101.8%.
No Action Regulard - all Surrogation within criticism (both Lab + QAPP)

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recovery and Precision

The matrix spike/matrix spike duplicate (MS/MSD) recoveries are reviewed to assess the accuracy of the results relative to the specific sample matrix and the relative percent differences (RPDs) are reviewed to assess the precision of the results relative to the specific sample matrix.

Review the unspiked sample, Matrix Spike, and Matrix Spike Duplicate (MS/MSD) raw data and recovery results. Were the recoveries for the MS/MSD calculated properly? Yes No.

Did the laboratory perform MS/MSDs for each matrix and matrix level analyzed for each analytical batch prepared for analysis? Yes No. If no, list below the affected samples.

Were the MS/MSD recoveries and precision within QAPP and method-generated accuracy limits? Yes No. Were the RPDs between the MS/MSD within the QAPP precision criteria? Yes No. If no, list below the affected compounds.

Was the %RSD for non-spiked compounds in the unspiked sample, MS and MSD ≤ 50%? Yes / No (NA



Action: No action is taken to the entire data set based on MS/MSD results alone. The unspiked sample may be qualified based on MS/MSD results as follows: if the MS/MSD recoveries were greater than the upper accuracy limit, estimate (J) positive results due to potential high bias; no action is required for non-detect results; if the MS/MSD recoveries were below the lower accuracy limit but above 10%, estimate (J and UJ) positive and non-detect results due to potential low bias; if a MS/MSD compound was recovered below 10%, estimate (J) positive results due to potential low bias and evaluate the non-detected results to determine whether estimation (UJ) or rejection (R) of the unspiked sample data is warranted. If the RPD between the MS and MSD > QAPP criteria, estimate (J and UJ) positive and non-detected results in the unspiked sample. If the %RSD, for a non-spiked compound, between the unspiked sample, MS, and MSD >50%, estimate (J) positive results and use professional judgement to qualify other detected and non-detected analytes.

Comments: Unspiked Sough = 5D-03 - All Results ND for Sough.
Lab used Lab generated 90 Rec QC Criteria for MS Conquels. The BC
exterior used was reasonable relative to QAPP exitate + in most cases
tigher than used in OAPP. To REC + TORPDS all within Lab limits
and OAPP Limits -
No Actim Required.

8. Laboratory Control Sample and Standard Reference Material Analysis

The Laboratory Control Samples (LCS) and/or Standard Reference Material (SRM) are reviewed to assess the accuracy of the results relative to the analytical procedure.

Review the raw data and recovery information for the LCS/SRM.

Did the laboratory perform a LCS or SRM for each matrix and matrix level analyzed Yes No. If no, list below the affected samples.

Were the LCS or SRM recoveries within QAPP and method-generated accuracy requirements for recovery? Yes No. If no, list below the affected compounds.

Action: If the LCS or SRM recoveries are above criteria, estimate (J) positive results due to potential high bias, no qualification of non-detected results is necessary. If the LCS or SRM recoveries are between 10% and the lower recovery limit, estimate (J and UJ) positive and non-detect results for the samples associated with the analytical batch due to potential low bias in the results. If the recovery in the LCS or SRM is less than 10%, estimate (J) positive results due to low bias and reject (R) non-detect results due to potential false negatives.

Comments: Lab pa	enformed LCS+ LCSD (Called UBLKOIMS+UBLKOIMED
Full Spile le	on Ketern and CSZ used for LCS'.
Picwekin 4	- RPDs for 3 sets of LCS/ICSD war within
Lab + QAPE	
No Ac	tim Required:
•	

9. Internal Standards

The Internal Standard (IS) response in the samples and standards is evaluated to ensure that the analytical system was in control during analysis.

Were the IS areas for each sample and standard analyzed within -50 to + 100% of the continuing calibration? Yes/No. Were the retention times for the IS within ± 30 seconds from the retention time established in the continuing calibration? Yes/No.

Action: If an IS area is greater than +100% compared to the continuing calibration, qualify positive results as estimated (J), non-detects do not require action. If the IS area is below -50% but not lower than -80%, estimate positive and non-detected results (U and UJ). If the area drop off or retention time shift for the IS is too severe (>-80%), non-detected results may require rejection (R). Professional judgment must be used in evaluating the data associated with poor IS performance.

Comme	IIIS.							
	IS	Areas +	RTS 1	ant ci	iterla			
	No A	tota Re	gorad.					, _
		101	4	······································	·····			
	 -							
								
	·							

10. Sample Quantitation Limits

Review raw data and reporting forms. Did the sample-specific RLs meet the QAPP criteria? Yes No. Did the laboratory accurately adjust sample reporting limits to account for sample specific preparation and analysis conditions? (Yes)No.

Were all components reported in the samples quantitated within the calibration region of the instrument for the detected analytes? Yes No Were the relative retention times for all components reported within the retention time windows established during initial calibration? Yes No

If the sample analyses were performed at dilutions, were more concentrated analyses performed or was sample screening information included in the data package? Yes / No. (NA) No Dilutions

Were sample dilutions appropriate relative to scaling of the chromatograms and the calibration levels employed (e.g., peaks of interest within upper half of the chromatogram and quantitation done within the calibration range)? Yes / No. (VA) (VA) (VA) (VA) (VA) (VA) (VA) (VA) (VA)

Action - If the quantitation limits for non-detect results are lower than the lowest calibration standard, or if a positive result is detected outside of the calibration range, estimate positive and non-detected results (J and UJ).

Comments:

lab didn't Analyze Acetar and Methylan Chlaide at Zppb
- I west ICAL standard for there two congenents was 5ppb.
All other Congruents analyzed at 2 ppb => All Congruents
except Acetre + Methylan Chrish were at QAPP RL.
-The Ris for Acetha + methylan charide were correctly
reputer at 5 mg/L.
No Actim Required

11. Field Duplicate Precision

Comments:

Field duplicate samples are reviewed to assess representativeness of the sample aliquot to the area sampled and the precision of the results relative to field sampling techniques.

Review analytical results for the duplicate sample analyses.

Action: If field duplicate precision exceeded 30% RPD for aqueous samples or 50% RPD for sediment samples for any compound, estimate (J and UJ) positive and non-detect results for the affected compounds in both samples. If severe imprecision was noted in the field duplicate sample (i.e., RPD > 100%), qualify the remainder of the associated field sample data based on sound technical judgment.

Field Duplicate Samples:	5D-2		5D-2 DUP	
Results for Bo Therefore field assessed.	th Songlin we	precision c	ed frale a	nalyth,
assessed.	0	<u> </u>		
				
	-			
		~		
				·····
		<u> </u>		

12. Additional QA/QC Issues

Were the percent solids for the samples >30%. Yes / No NA.

The sampling for volatile sediment samples was modified from Method 5035 in an attempt to appropriately deal with sediments with very low solids content (<30%). As such, the low-level preservation technique required sampling approximately 5g of sediment and placing the sample under 5mL of water (method 5035 suggests a 1:2 ratio of soil to water). The medium- or high-level preservation technique also required 1:1 methanol to sample preservation. Therefore, while Region I data validation guidelines require that data be estimated (J) and/or rejected (R) based on low %solids content of the samples, no action was taken to qualify sediment sample results based on solids content for this project.

List any additional issues which may affect the quality of the results. List the affected samples, QA/QC issue, and necessary actions taken in the comments section below.

Lub sequence sheets show pHLZ for all sorgh - this is done
in las during analysis.
- Dut of Sangling incorrect for sacral Songle in the Dachbare Excel
Sile (Date received uses instead of Sagling date) > During assessment
file (Date received uses instead of 3 agilly date) > During assersmit The dates were corrected in The DB file.
0

IVA. Example Sample Calculations

Review of one sample per data package is performed to determine if sample results and quantitation limits were correctly calculated and reported.

Sample ID: SD-07 Deep was selected for review in this data package.

Form 1 Review

- Were the Form 1s for completed according to the method/QAPP requirements? (Yes) No. If no, list 1. below the affected fields.
- Reproduce the reporting limit for VOC in one of the samples, did the laboratory correctly calculate the quantitation limits? (Yes/No. If no, list below. DF=1; RL=ZMJL

Quantitation Review

Reproduce a calculation for one volatile analyte in one of the samples that contained a positive result and compare the calculated result to the result reported by the laboratory.

Analyte Checked: Benzes

Laboratory Result: 63 Mg/L Calculated Result: 63 Mg/L

Example Calculation: 5 mL purpe of 5td + Sugh Burgen Response = 1279083

IS Response = 82185 @ 50ppb

RRF Benzer = 12.274

Conc. Bonzu= 1279083×50 = 63.4 ng/L

Industriplex, Woburn, MA 8270C Data Usability Review
5VUC- Surface Water

IIIB. Review of Semivolatile Organic Data

1. Holding Times

Holding times and QC association with the samples are reviewed to ensure the accuracy of the reported results. The table on the following page (Table 1a) was completed to document the holding times and QC association.

Review the Semivolatile Organic Analysis Data Sheet.

Were the holding time requirements (surface waters extracted within 7 days; sediment and biota extracted within 14 days of sampling (or of thawing for biota) and extracts analyzed within 40 days of preparation) met for each sample? Yes No. If no, list below the affected samples and the number of days outside of holding time.

Action: If the holding times were slightly exceeded, estimate (J and UJ) positive and non-detect results. If the holding times were grossly exceeded (more than twice the allowed holding time), professional judgment should be used to determine the action necessary. Evaluation of screening, undiluted and dilution analyses, if available, should be made to determine the impact of the holding time violation on the data quality (e.g., whether or not positive values are estimated (J) and whether non-detected values should be estimated (UJ) or rejected (R)).

Comments:						
All HTS mut	, no act:	m requ	ired.			
						
Sam sles	Leces	red	6/21/99	at	7°C.	
Samples No Action -	All	ex sla	anation	-00	1- VOA	
				18		<u> </u>
			· · · · · · · · · · · · · · · · · · ·			2 /a /a a
					·	
						
						_
						

Table 1a. Holding Time and Associated QC Table

Sample Matrix: Water 17 Waters + Imsims + 4RB

Date/Time Field Methors Sampled Blank Blan		Blank	LCS	Date/Time Extracted	Date/Time Analyzed	
6/17/99 11:30	RB 6/17	50062381	SW0623L1	6123 199	718199	
617199 13:18	(42547-2)					
617 15130	J				<u> </u>	
6/18 9130					7/9/99	
6/18 10:00	(42551-3)					
6/18 10:30						
6/18 11:40				ļ		
6 18 15:30						
6118 16130						
6/18/6:30						
6/18 17:30				ļ		
6 18 17:30	<u> </u>	<u> </u>	y			
6 21	RB 6/21	SWOGZERI	SW0628LI	6/28/99		
6121	(42562-3)					
6 21						
6121						
6 21_	¥					
6/22/99	RB6 22			ļ		
6/22	(425634)	y	J.	<u> </u>		
		,				
	6 1 7 15:30 6 17 15:30 6 18 9:30 6 18 10:00 6 18 10:30 6 18 15:30 6 18 16:30 6 18 17:30 6 18 17:30 6 18 17:30 6 21 6 21 6 21 6 21 6 21	6 1 7 19 13 18 (42547-2) 6 17 15 30 6 18 9 30 RB 6 18 6 18 10:00 (42551-3) 6 18 10:00 6 18 15:30 6 18 15:30 6 18 17:30 6 18 17:30 6 18 17:30 6 21 6 21 6 21 6 21 6 21 6 21	6 17 99 (3)18 (42547-2) 6 17 (5:30 6 18 9:30 RB 6 18' 6 18 10:30 6 18 11:00 6 18 15:30 6 18 16:30 6 18 17:30 6 18 17:30 6 18 17:30 6 21 6 21 6 21 6 21 6 21 6 22	6 17 99 3:18 (42547-2) 6 17 15:30 6 18 10:30 6 18 15:30 6 18 17:30 6 18 17:30 6 18 17:30 6 18 17:30 6 18 17:30 6 21 6 21 6 21 6 21 6 22 99	6 17 199 13:18 (42547-2) 6 17 15:30 6 18 19:30 6 18 19:30 6 18 15:30 6 18 17:	

instead.

2. GC/MS Instrument Performance Check

The DFTPP instrument performance checks (tunes) are reviewed to assess the accuracy and sensitivity of the results relative to instrument performance.

Review the tune summaries for DFTPP

Were all Method 8270C defined mass calibration and ion abundance criteria met for the DFTPP analyses? (Yes //No. If no, list below the tune and affected samples.

Review the raw data for one tune. Did the laboratory obtain the DFTPP mass spectrum in a straightforward manner (e.g., average of three scans centered across the DFTPP peak with background subtraction from a scan within 20 scans prior to the DFTPP scan)? (Yes) No. If no, list below the method used to obtain the mass spectrum and the affected samples.

Were all samples analyzed within 12 hours of an acceptable tune? Yes No. If no, list below the affected samples.

Action: If the mass assignment criteria were not met (e.g., base peak assigned to m/z 199 instead of m/z 198), reject (R) all associated data. If the ion abundance criteria were not met, sound technical judgment should be used in evaluating whether or not the data require estimation (U and UJ) or rejection (R) (e.g., the criteria requirements for the m/z 198/199 and 442/443 ratios and relative abundances of m/z 68, 70, 197, and 441 are most important for proper tune while the relative abundances for m/z 51, 127 and 275 are of lesser importance.)

Comments:

The Form 5's (Time Summany) have lettest sow CLP Critician which
are not the same as method 8270c - The van tune summary
of the Instruct does have The 8270c Time criteria (i.e., las
The Form 5's (Time Summany) have latest sow CLP Critician which are not the same as Method 8270c - The van time summany of the Instruct does have the 8270c Time criterian (i.e., lass did use 8270c criteria for Tune + Tunes all met that criterian even though the Form 5 criterian shown were not
criteria even though the Form 5 criteria shows were not
82706)
No Actin liquired.

4. Initial Calibration

The initial calibration data are reviewed to determine if the standards were compliant with the method protocols.

Review the Initial Calibration Data Summary. Check and recalculate the RRFs, RRF and %RSD for at least one polynuclear aromatic hydrocarbon (PAH) analyte across the ICAL. Does the RRF and %RSD check back to the raw data? Yes No. Were the RRFs for all analytes in the standard all greater than or equal to 0.05? Yes No

Were at least five concentration levels of each compound analyzed during the initial calibration? Yes No Were all calibration standards analyzed within 12 hours of DFTPP tune? Yes No

Was the lowest initial calibration standard at a concentration equivalent to the sample-specific reporting limit? Yes (No) - Yes fralk but hexachlanocyclopentadiene - See page 447-5000

Were retention times for each target analyte stable across the calibration (i.e., minimum drift)? Yes/ No

Did the initial calibration meet %RSD criteria of ≤ 30% for all analytes (surrogates and targets) across the calibration range? Yes (No.)

Did the initial calibrations meet %RSD criteria of \leq 15% for target analytes and surrogates across the calibration range? Yes /No. If no, was a calibration curve used for quantitation of results and was the correlation coefficient for the curve \geq 0.99? Yes /No. Was the curve forced through the origin? Yes / No. If no, list below all the affected samples.

Action: If the %RSD >30% and average RRF \geq 0.05, qualify positive and non-detected results as estimated (J and UJ). If the %RSD >30% and average RRF < 0.05 estimate positive results (J) and rejecy non-detected results (R). If the %RSD \leq 30% and average RRF < 0.05 estimate positive results (J) and reject non-detected results (R). Sound technical judgment should be used in qualification of the data. The results for each sample associated with ICAL should be evaluated to determine if a result reported would be impacted by the mis-calibration.

Comments:

ICAL Check: Compound Checked Phenanthene

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Avg. RRF	%RSD
Concentration	2 mg/ml	5 mg/ml	10 Agfal	1549/1	عما رسود	youghe		
Response Cpd	718951	1916770	3560431	5644786	8412079	13035168		
Conc, IS	10 m/m		ſ	ľ	1005hl			
Response IS	288392	3198791	2999192	3279991	3079877	3046986		
RRF	1.247	1.198	1.187	1.147	1.366	1.070	1.202	8.3

ml weights (firethes).

10/27/9

volume

5. Continuing Calibration Check

The continuing calibration data are reviewed to determine if the standards were contractually compliant

Review the Continuing Calibrations and Summaries. Check and recalculate the RRF and %Difference (%D) for at least one of the PAH in one of the CCALs. Does the RRF and %D check back to the raw data? Yes No. Were the RRFs for all analytes in the standard all ≥ 0.05 (Yes) No

Was a continuing calibration check performed every 12 hours following tuning verification of the instrument? (Yes) No. If no, list below all the affected samples.

Were the target analytes recovered within the expected retention time window based upon the initial calibration (i.e., drift of instrument was acceptable)? Yes No.

Did the continuing calibrations meet 8270C criteria for verification of %D \leq ±25%? Yes $\stackrel{\text{No}}{}$ If no, list below the outliers and the affected samples.

Action: If the %D > \pm 25% and the CCAL RRF \geq 0.05, estimate positive and non-detected results (J and UJ) for samples analyzed following this standard for the compound(s) that was outside of calibration. If the RRF <0.05, qualify positive results as estimated (J) and reject (R) non-detected results as unusable.

Comments:

CCAL Check: Standard II	O CO 70801,D : Cor	npound Checked <u>Chr</u>	ysen
Responses	RRF	avg. RRF ICAL	% Difference
Cpd: 3091467	1.246- 1.202	1.246	3.5
IS: 2570749 @10	WANDA ST		
Consolates a same	164 and 2000 20 and	l 1.t	L. C
CCHC 718199 @ 19.9	5 (FILL CO +081.0) - H	le rainimocycloper	tadine 900=37.75 -A11
others OK (== 259	(4)		· · · · · · · · · · · · · · · · · · ·
	•	617199	
Adim: Results of	w Sage 5004, R	8,(42547-2), SD.	-12,50-13,50-03,
50-03 Deco , RB	1(45251-3), 5D-06.	50-07 Deep, 50-	07 Shaller, SDO5 Deep+
•		T	•
50-05 Shallas a	unlitted as estim	etal (UJ) fort	texachterocyclopentadian
CCAL Flalan Q 12	IN (FIL COROBOLT	o)- 24-Dinitrooh	mal 90D=25/2=-1A11 of
			mol 90D=25.695-All of
Actini Resulte of	· Souple RBA(425	562-3), RB/4251	(3-4), RB, (42563-14),
5002,50-20L	AP, 50-01, 50-10	, SD-11, SD-8	+ SDO qualified
	UJ) 1~ 2,4-Din		,

5. Laboratory and Field Blank Results

Laboratory and field blank results are reviewed to assess the presence of contaminants, which affect the accuracy and sensitivity of the results. See Table 1a. where the Holding Time and Associated QC Table was completed for the samples within this SDG.

Was each sample analysis associated with the appropriate method blank, ie., correct matrix, correct matrix level, same extraction batch? (Yes) No. If no, list below affected samples.

method and field blank. Were any target compounds in the metho compounds phthalates and were they reported at < 5 times the RL? Yes (No.) If yes, were they compounds phthalates and were they reported at < 5 times the RL? Yes (No.) - Yes (10.) - Y Review the reporting forms for each method and field blank. Were any target compounds in the method blanks detected at concentrations above the Reporting Limit (RL)? (Ya)/(No.) If yes, were these Blanks should not contain contaminants above the RL except for phthalates that must not be present above 5 times the RL. The Blank Action Level is defined as five times the highest level seen in any of the matrix-matched blanks associated with this SDG, except if phthalates are present in the Blank action is ten times the highest level observed in actions should be milest. RB 6/22 (42563-9) with Di-n-but parthalet at 24 mg/ with RL= tag/ (If the blank is not matrix matched, qualify all sample data, for the contaminant associated with this blank, with BB or EB, as appropriate. If the reported result in a sample is below the reporting limit (sample < RL) and if a matrix-matched blank contains a result above the quantitation limit (blank > RL), the result in the sample should be negated (U) and raised to the sample-specific RL for that sample 7. If the sample result is between the reporting limit and the blank Action Level (RL < sample < Action Level), the result for the sample is negated (U) at the level found in the sample. Based on the level of contamination suspected in the sample, the reporting limit may be elevated. Professional judgment will be used in assessing the action needed. If the sample result is greater than the RL and the blank Action Level, no potron is taken. RB (179 (42547-2); RB 6/18 (42551-3); RB 6/21 (42562-3) + RB 6/22 (42563-7) Comments:
Blanks evaluated: 5w062381 + Sw062881 - All ND. RBs have truck - > RL except 425513 which is ND. No Action required since none of the surple reported Di-n-butyl phthalit Highest Blank: Action taken: Sample ID Compound Reported Result Result based on Blank Action

6-SVOC

No runte blanks were associated with

water samples.

6. Surrogate Spike Recoveries

The surrogate spike recoveries are reviewed to assess the accuracy of the results relative to laboratory performance and specific sample matrix.

Review the Surrogate Recovery information for each field and quality control sample. For one sample, verify that the recoveries reported correspond to the raw data and that the recovery calculation was done properly. Were the recovery data reported properly? Yes No.

Were the surrogate recoveries within QAPP defined and method-generated accuracy limits? Yes (No.) If no, were the affected samples reanalyzed? Yes (No.) List below the affected samples.

Action - If two Base/Neutral (BN) or two Acid surrogate recoveries exceed the upper limit, estimate (J) positive results (for the fraction affected) due to a potential high bias of the results; no action is required for non-detect results. If two BN or 2 Acid surrogate recoveries are below lower accuracy limit but above 10% recovery, estimate (J and UJ) the positive and non-detect results, for the affected fraction, due to a potential low bias in the results. If any surrogate recoveries are below 10%, reject (R) non-detect results and estimate positive results (J) due to potential false negatives and low bias in the results, respectively. List below the affected samples and required actions.

Comments: Lab spiked only BN Surrogates since this was how they had spiked sediment samples. NCR contracted lab on 8/16/99 questioning why BN Surrogates used and an Addendum I to narrative was issued. Lab advised that in fature, all water analyzes for SVOC MUST have full Surrogate Spike (only BN used since for Sediments the extraction for SVOC, Pesticides + PCBs are also from a single sample aliquot as I the acid surrogate will interfere with ECD analysis. Surrogate spiking probably as sediments discussed with Analy Beliveau on 9/25/99 + Analy advised NCR to use LCS + ms/msD information, if necessary, to qualify acid compands (i.e., don't estimate acid results unless other OC shows problems with acids). For this I Surface water SOC, this protocol for using LCS + ms/msD information to evaluate Azid Cangonal will also be used.

> LCS + ms/msD 90 Preception of all Acid compands acceptable > AII BN Surrogate OK except for Sangle SD-II.

limit (lab narrative indicate that lab believes a double spile of surrogate added during extrator since all other sand in land. It.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recovery and Precision

The matrix spike/matrix spike duplicate (MS/MSD) recoveries are reviewed to assess the accuracy of the results relative to the specific sample matrix and the relative percent differences (RPDs) are reviewed to assess the precision of the results relative to the specific sample matrix.

Review the unspiked sample, Matrix Spike, and Matrix Spike Duplicate (MS/MSD) raw data and recovery results. Were the recoveries for the MS/MSD calculated properly? (Yes)No.

Did the laboratory perform MS/MSDs for each matrix and matrix level analyzed for each analytical batch prepared for analysis? Yes No. If no, list below the affected samples.

Were the MS/MSD recoveries and precision within QAPP and method-generated accuracy limits? Yes No. Were the RPDs between the MS/MSD within the QAPP precision criteria? Yes No. If no, list below the affected compounds.

Was the %RSD for non-spiked compounds in the unspiked sample, MS and MSD ≤ 50%? Yes / No (NA



Action: No action is taken to the entire data set based on MS/MSD results alone. The unspiked sample may be qualified based on MS/MSD results as follows: if the MS/MSD recoveries were greater than the upper accuracy limit, estimate (J) positive results due to potential high bias; no action is required for non-detect results; if the MS/MSD recoveries were below the lower accuracy limit but above 10%, estimate (J and UJ) positive and non-detect results due to potential low bias; if a MS/MSD compound was recovered below 10% or not at all, estimate (J) positive results due to potential low bias and evaluate the non-detected results to determine whether estimation (UJ) or rejection (R) of the unspiked sample data is warranted. If the RPD between the MS and MSD > QAPP criteria, estimate (J and UJ) positive and non-detected results in the unspiked sample. If the %RSD, for a non-spiked compound, between the unspiked sample, MS, and MSD >50%, estimate (J) positive results and use professional judgement to qualify other detected and non-detected analytes.

omments: Lab Limits = QMPP Limits.
mymod on 5003 (unspiled Sough was ND for all analytis
18 FEC & RID JE HOIMSD MED LYHIT CHUIC-
No Actim Required.

8. Laboratory Control Sample and Standard Reference Material Analysis

The Laboratory Control Samples (LCS) and/or Standard Reference Material (SRM) are reviewed to assess the accuracy of the results relative to the analytical procedure.

Review the raw data and recovery information for the LCS/SRM.

Did the laboratory perform a LCS or SRM for each matrix and matrix level analyzed? Yes No. If no, list below the affected samples.

Were the LCS or SRM recoveries within QAPP and method-generated accuracy requirements for recovery? (Yes) No. If no, list below the affected compounds.

Action: If the LCS or SRM recoveries are above criteria, estimate (J) positive results due to potential high bias, no qualification of non-detected results is necessary. If the LCS or SRM recoveries are between 10% to the lower recovery limit, estimate (J and UJ) positive and non-detect results for the samples associated with the analytical batch due to potential low bias in the results. If the recovery in the LCS or SRM is less than 10%, estimate (J) positive results due to low bias and reject (R) non-detect results due to potential false negatives.

Comments: 5	W0623L1	4 3000	,202.			
AIL	Criteria 1	~ LCS	Met - no	Actim	legisted.	
	<u> </u>			· · · · · · · · · · · · · · · · · · ·	<u> </u>	
					<u> </u>	
		· · · · · · · · · · · · · · · · · · ·				
		·				

9. Internal Standards

The Internal Standard (IS) response in the samples and standards is evaluated to ensure that the analytical system was in control during analysis.

Were the IS areas for each sample and standard analyzed within -50 to + 100% of the continuing calibration? Yes/No. Were the retention times for the IS within ± 30 seconds from the retention time established in the continuing calibration? Yes/No.

Action: If an IS area is greater than +100% compared to the continuing calibration, qualify positive results as estimated (J), non-detects do not require action. If the IS area is below -50% but not lower than -80%, estimate positive and non-detected results (U and UJ). If the area drop off or retention time shift for the IS is too severe (>-80%), non-detected results may require rejection (R). Professional judgment must be used in evaluating the data associated with poor IS performance.

Avens + RTs all met criticis -	
No Arctim Reguland.	
	_
	Aveces + RTs all met cuitur - No Arctim Required.

10. Sample Quantitation Limits

Review raw data and reporting forms. Did the sample-specific RLs meet the QAPP criteria? Yes No.

Did the laboratory accurately adjust sample reporting limits to account for sample specific preparation and analysis conditions? Yes No.

Were all components reported in the samples quantitated within the calibration region of the instrument for the detected analytes? Yes No Were the relative retention times for all components reported within the retention time windows established during initial calibration? Yes No

If the sample analyses were performed at dilutions, were more concentrated analyses performed or was sample screening information included in the data package? Yes / No() A) - No() A

Were sample dilutions appropriate relative to scaling of the chromatograms and the calibration levels employed (e.g., peaks of interest within upper half of the chromatogram and quantitation done within the calibration range)? Yes / No. (NA) - No Dilutims

Action - If the quantitation limits for non-detect results are lower than the lowest calibration standard, or if a positive result is detected outside of the calibration range, estimate positive and non-detected results (J and UJ).

Comments: Lub's launt ICAC standard was at 2 mg/mc, which assuming
Comments: Lub's launt ICAC standard was at 2 mg/mi, which assuming IL extraction to a final volume of 2 ml (us was done) hads to sangle-
specific RL= 4 mg/L. QAPP required RL was 5 mg/L for most svoc
with 8 Aniline, Phunch + 2,6-Dinity tolun at 12-27/2. Therefore, Lab's RLs
generally & QATP required BLs with the following exceptions:
- Hexachlorocyclopentadiene last ICAL was at 5 Mg/mc = PL = 10 Mg/mc
of IL extracted to Int: QAPP RL for this compand was 5 45/2 =>
RL reported high by a factor of 2 (Passel's changed - see page 44-5voc)
- 3-Nitrounilin QAPP RL= 5 MJL, Lab reports 10 MJL - ICAL
indicates lowest ICAL for 3. Nitroanilin was ZAD/ML => RL reported
too High
* Action - RL fr 3-Nitrouniline lowered to 4/19/1 on sough specific
The state of the s
larges from 4 to 5 ugle on a Sample-specific basis).

Compand	OMP RL	50°02_	SD-2Dur	SD-01	SD-IL
2.4:Dintrophenal	1219k	1341	136h	1305/	13 49/4
1-Nitrophenol	12Mg/L	13	13	13	_13
initro-2-methylpheno	1 12mg/L	13	13	13	13
entachling phonel	12m/k	13	13	13	13
Trich I wophend	12417/	13	13	13	13
10: Kophanduce	9/24/49			 	· -
Nitronniline	12/19/2)3	13	13	13
Nitoaniline	1249/	13	13	13	(3
olune extrat	4	760mc	750mL	760mL	770mL
All other RL	s except	on noted	In hexact	loocade	opentadies
All other RL	criteria 1	Centere Im	ser or at	CAPP	RIS).
					

11. Field Duplicate Precision

Comments:

Field duplicate samples are reviewed to assess representativeness of the sample aliquot to the area sampled and the precision of the results relative to field sampling techniques.

Review analytical results for the duplicate sample analyses.

Action: If field duplicate precision exceeded 30% RPD for aqueous samples or 50% RPD for sediment or biota samples for any compound, estimate (J and UJ) positive and non-detect results for the affected compounds in both samples. If severe imprecision was noted in the field duplicate sample (i.e., RPD >100%), qualify the remainder of the associated field sample data based on sound technical judgment.

Field Duplic	ate Samples: 50 -	2		50-2 Dup	
_AII Fleed	analyto in duplicati	both sa	des were	non-det	ects => ensed.

12. Additional QA/QC Issues

Were the percent solids for the samples >30%. Yes / No /NA

List any additional issues which may affect the quality of the results. List the affected samples, QA/QC issue, and necessary actions taken in the comments section below.

Action: If the %solids were between 10% and 30%, qualify positive results as estimated (J) and reject non-detected results (R). If the %solids were < 10%, reject (R) positive and non-detected results.

No additional issue noted other than Songling Date on Dahbare Excel file for several Songler incorrect. The correct date was added to the excel file.

IVB. Example Sample Calculations

Review of one sample per data package is performed to determine if sample results and quantitation limits were correctly calculated and reported.

Sample ID: 50-05 Deep was selected for review in this data package.

A. Form 1 Review

- 1. Were the Form Is for completed according to the method/QAPP requirements? Yes No. If no, list below the affected fields.
- 2. Reproduce the reporting limit for SVOC in one of the samples, did the laboratory correctly calculate the quantitation limits? Yes No. If no, list below. But = 4,15/L

Reproduce a calculation for one semivolatile analyte in one of the samples that contained a positive result and compare the calculated result to the result reported by the laboratory.

Example Calculation: 920 MC extracted to Zmc final volume; DF=1

Phenol Response = 309930 Is Resp = 690707 @ 10,49/ml RRF Phenol = 1.956

Industri- Plex, Woburn, MA

8081A and 8082 Data Usability Review

Pest/AB - Surface Water

IIIC. Review of Data

Holding Times

Holding times and QC association with the samples are reviewed to ensure the accuracy of the reported results. The table on the following page (Table 1a) was completed to document the holding times and QC association.

Review the Pesticide and Aroclor Data Sheets.

Were the holding time requirements (surface waters extracted within 7 days; sediment and biota extracted within 14 days of sampling (or thawing for biota) and extracts analyzed within 40 days of preparation) met for each sample? Yes No. If no, list below the affected samples and the number of days outside of holding time.

Action: If the holding times were slightly exceeded, estimate (J and UJ) positive and non-detect results. If the holding times were grossly exceeded (more than twice the allowed holding time), professional judgment should be used to determine the action necessary. Evaluation of screening, undiluted and dilution analyses, if available, should be made to determine the impact of the holding time violation on the data quality (e.g., whether or not positive values are estimated (J) and whether non-detected values should be estimated (UJ) or rejected (R)).

t - no actim rea	juired.		
received 6	121/99	at 7°C	. See
-40 A . No A	ction.		SUC 12/9/99
	· · · · · · · · · · · · · · · · · · ·		
			t-no actim required. Received 6/21/99 at 7°C -VOA: No Action.

Table Ia. Holding Time and Associated QC Table

Sample Matrix: Water - 17 Waters + 1 ms land + 4 RB

Sample ID	Date/Time Sampled	Field Blank	Method Blank	LCS	Date/Time Extracted	Date/Time Analyzed
SD04 (42547-1)	6117199 11:30	RB 6117	PW062381	PW0628 L1 PW062362	6/23/99	7/14/99
5012 (42547-3)	6117 13:18	(42,547-2)	(-			7/15/99
50-13 (42547-4)	6 17 15:30	<u> </u>				7/15/99
50-03 (42551-1)	6/18 9130	RB 6/18			1	2/15/99
50-03M(42551-1m5)	6/18 10:00	(42551-3)				7/15/99
5D-03/(4259-MSD)	6/18 10:30					7/15/99
15D-03 Dece (42551-2)	6/18 H:00					7115 99
50-06 (42551-5)	6118 15:30			├\├		7/16/99
5D-07 Deep (-6)	6118 16:30		-			7/16/99
50-07 Shallow (-7)	6/18 16:30				1	7/16/99
50-05 Deep (-8)	6118 17:30					7/16/99
-05 Shallas (-9)	6/18 17:30	<u> </u>		PW 0625E1	<u> </u>	7/16/99
30-2 (42574-1)	6/21/99	RB 6/21	PN0625B1	PW0625LZ	6 25 99	7/17/99
50-2 Dup (2)	6/21	(42562-8)				7/17/99
50-01 (-3)	6/21					7117199
50-10 (-4)	6121					7/17/99
SD-11 (-5)	6121	<u>v</u>				7/17/99
50-8 (42575-1)	6/22/99	RB6 22				7/17/99
50-9 (-2)	(e)22	(42563-4)	<u> </u>	<u> </u>	1-2	7/17/99
			2 4	210 0623 L1	411-	
RB 6/17 (42547-2)	617	NIA	PW0623B1	PW0623LZ	6 23 94	71599
RB 6/18 (42 351-3)	6118		<u> </u>	PW06251	<u> </u>	<u> </u>
RB 6/21 (42562-3)	6 21	-	PW0625B1	PW0625L2	6/25/95	717199
RB 6/22 (42563-9)	' •					
RB 6/23 (42563-14)	6 23	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
					ļ	
		·			<u> </u>	
		 			<u> </u>]

2. GC/ECD Instrument Performance Check

The instrument performance check, called Performance Evaluation Mixture (PEM) is analyzed to ensure the accuracy and sensitivity of the results relative to instrument performance.

Review the PEMs for the Pesticides.

Comments:

Was the degradation of 4,4'-DDT to 4,4'-DDE and 4,4'-DDD <15% and was the degradation of Endrin to Endrin aldehyde and Endrin ketone < 15%? Yes No. Were all compounds in the PEM 90% resolved on each GC Column Yes No If no, list below the affected samples.

Was a PEM analyzed daily or every 12 hours o instrument use? Yes No. If no, list below the affected samples.

Action: If resolution of the PEM compounds is not acceptable (on one or both columns) professional judgment must be used in qualifying data. For example, if resolution is poor on both columns for two analytes, and if a sample reports one or both of these analytes as detected, the positive results should be qualified as estimated (J) due to uncertainty in quantitation and possibly in qualitative identification. If the breakdown for DDT and/or Endrin exceeds 15%, qualify all positive results for these compounds as estimated (J). If these two compounds are not detected, but their breakdown products are detected, qualify the DDT and/or Endrin non-detect result as rejected (R) and qualify the breakdown products as estimated (J).

5 PEMS evaluated - All OK No Action Required	_
)	_
	_
	_
	_
	_

5. Initial Calibration

The initial calibration data are reviewed to determine if the standards were compliant with the method protocols.

Review the Initial Calibration Data Summary for Pesticides and PCBs. Were linear (RRFs or CFs) statistics or calibration curves used in the initial calibration? Linear (Curve) If linear calibration, check and recalculate at least one pesticide compound and one peak for an Arochlor across the ICAL. Does the RRF and %RSD check back to the raw data? Yes / No. Did the initial calibration meet %RSD criteria of ≤ 30% for all analytes (surrogates and targets) across the calibration range? Yes / No. If no, was the average %RSD for all analytes in the calibration ≤ 30%? Yes / No. Were the RRFs for all analytes in the standard all greater than or equal to 0.05? Yes / No.

If curve statistics were used for the initial calibration, was the regression coefficient > 0.99 Yes No. Were the curves generated with sufficient points (linear with 5 points, quadratic with 6) Yes No. Was the curve forced through the origin? Yes No. If yes, resubmittal of calibrations and samples must be requested to correct this non-compliance issue. — Reissued data (see page 3b) was not detailed through within.

Was the lowest initial calibration standard at a concentration equivalent to the sample-specific reporting limit (Yes) No.

Were retention times for each target analyte stable across the calibration (i.e., minimum drift) (Yes)/ No

Action: If the %RSD >30% and average RRF ≥0.05, qualify positive and non-detected results as estimated (J and UJ). If the %RSD >30% and average RRF < 0.05 estimate positive results (J) and rejecy non-detected results (R). If the %RSD ≤ 30% and average RRF < 0.05 estimate positive results (J) and reject non-detected results (R). If the regression coefficient < 0.99, qualify positive and non-detected results as estimated (J and UJ). Sound technical judgment should be used in qualification of the data. The results for each sample associated with ICAL should be evaluated to determine if a result reported would be impacted by the mis-calibration. For curve analysis, if the percent Difference (%D) between the calculated area and the reported area > ±25%, qualify positive and non-detected results as estimated (J and UJ).

Comments:

3. Initial Calibration - continued

Linear PCB ICAL Check: Compound/Peak Checked(NA)	Linear PCB ICAL Check:	Compound/Peak Checked	(NA)) 	
--	------------------------	-----------------------	------	-------	--

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Avg. RRF %RSD
Concentration							
Response Cpd							
Conc, IS							
Response IS							
RRF							

If curve statistics are used, verification of the computer generated equation may be difficult across the ICAL. Instead, a check is made for one pesticide and one PCB peak to determine whether the equation matches the data obtained as follows:

Curve equation:

$$y = a + bx + cx^2 + dx^3$$

Where:

y = Area compound

or y = Area compound (external std. calibration)

Area Internal Standard

x = Concentration Compound Concentration IS or x = Conc. compound (external std calibration)

Since solving for x is somewhat difficult, the system is checked by using the Calculated Compound Concentration to solve for the Area of the compound as follows:

Pesticide Compound evaluated: Dieldrin - Channel A

Standard evaluated: 8081 L.S.

ICAL calibration formula:

Amount Reported	Amount of IS	Calculated x	Calculated y	Area of IS	Calculated Area of compound	Reported Area of Compound
106.1367	50	2.1227	2.5962	78659	204219	163380
					%Difference	20.0%

8081A and 8082 Data Usability Review

3. Initial Calibration - continued

PCB Peak evaluated: Av 1016 Peak # 2

Standard evaluated: 166014 - Channel A - 7/14/99 @ 15:08

ICAL calibration formula:

y= (2839.324341) + (97.961567) x + (-0.006172) X2 + 0X3

Amount Reported	Amount of IS	Calculated x	Calculated y	Area of IS	Calculated Area of compound	Reported Area of Compound	
317.7078	NIA	317.7078	33339	NIA	33339	31119	
%Difference							

Peoticide lavest ICAL = I uglant i however Peoponse van la. Leb set
Protech larest ICAL = I reglow i homener Perposervan In. let set RL bund a next larest strl of 2 as/or . RL = 245/or × 1000 or = 0.00
- Some state were I wer then 4 Mg/mc; haverer, Pl mit OAPP Requirent
- 1CAC run on 8-luck AK1660 - with single pt AR1221, 1232, 1242,
1249, 1254 + Toxaphur.

8081A and 8082 Data Usability Review

6. Continuing Calibration Check

The continuing calibration data are reviewed to determine if the standards were contractually compliant.

Review the Continuing Calibrations (CCAL) and Summaries. If average RRFs or CFs are used, check and recalculate the RRF and %Difference (%D) for at least one of the Pesticides and one of the PCBs in one of the CCALs. Does the RRF or CF and %D check back to the raw data? Yes / No Were the RRFs for all analytes in the standard all ≥ 0.05? Yes / No \(\nabla P\) because \(\nabla P\) because \(\nabla P\) with \(\nabla P\).

If curve statistic calibrations were used, check one of the CCALs for one Pesticide and one peak for a PCB to determine if the calibration relates properly back to the corresponding ICAL. Do the CCALs properly reference the correct ICALs (Yes) No.

Was a continuing calibration check performed every 12 hours following tuning verification of the instrument? (Yes) No. If no, list below all the affected samples.

Were the target analytes recovered within the expected retention time window based upon the initial calibration (i.e., drift of instrument was acceptable) (Yes) No.

Did the continuing calibrations meet 8081A and 8082 criteria for verification of %D $\leq \pm 15\%$ or %Drift $\leq \pm 15\%$ for every compound? Yes No Did the continuing calibrations meet 8081A and 8082 criteria for verification where the average of all compounds analyzed had %D $\leq \pm 15\%$ or %Drift $\leq \pm 15\%$ for every compound? Yes / No If no, list below the outliers and the affected samples.

Action: If the %D or %Drift for a compound > ±15%, estimate positive and non-detected results (J and UJ) for samples analyzed following this standard for the compound(s) that was outside of calibration.

Comments.			
Linear CCAL Pesticide che	ck: CURVE	(NA)	
CCAL Check: Standard II):(Compound Checked	
Responses	RRF/CF	avg. RRF(CF) ICAL	% Difference
Cpd:			
IS:			14
Linear CCAL PCB check:		IA)	
CCAL Check: Standard II):	PCB/peak Checked	
Responses	RRF/CF	avg. RRF(CF) ICAL	% Difference
Cpd:			
IS:	-		

Continuing Calibration Check - continued

If curve statistics are used, verification of the computer generated equation may be difficult across the ICAL. Instead, a check is made for one pesticide and one PCB peak to determine that the correct equations were used to generate the amount found in the CCAL standard

Curve equation:

$$y = a + bx + cx^2 + dx^3$$

Where:

or
$$y = Area compound (external std. calibration)$$

Area Internal Standard

or
$$x = Conc.$$
 compound (external std calibration)

Since solving for x is somewhat difficult, the system is checked by using the Calculated Compound Concentration to solve for the Area of the compound as follows:

Pesticide Compound evaluated: 4,4'-000

Standard evaluated: 8081 CCV 7/14/94 @ 17:37 Channel A

ICAL calibration formula:

39.38		40		+1.5	690 /	equation for Drift Bod	
Amoun	t Found	Theoretic	Theoretical Amount		Drift		
					%Difference	0	
39.3792	50	0.7876	0.7129	82231	58622	58622	
Amount Reported	Amount of IS	Calculated x	Calculated y	Area of IS	Calculated Area of compound	Reported Area of Compound	

Endrin Ketan Channel A 7/15/99@04112 808/CCV at 2290 - Channel BOK No Holler * CCV out - 71580811 7/15/99 @ 16:01 8081CCV - 14 Channel B carports Average 90D for All >1590; 6 Channel A Conganto out - Lub Originally performed calibration improperty (resubmittel requested) and this standard was OK; hoverer, re-quantification using correct collibration protocols indicate that this CCV was non-compliant.

8081A and 8082 Data Usability Review

4. Continuing Calibration Check - continued

PCB and Peak evaluated: AR1260 Peak #2

Standard evaluated: A9711601 7/14/94 @ 18:34 Channel B

ICAL calibration formula:

Y= (-2762.916314)+ (177.065184)x+ (-0.012052)x2+0x3

Amount Reported	Amount of IS	Calculated x	Calculated y	Area of IS	Calculated Area of compound	Reported Area of Compound	
905.0029	NIA	905.0029	147611	NIA	147611	147611	
					%Difference	0	
Amoun	t Found	Theoretic	al Amount	%	Drift	Lab mon til	-105-
901.36		1000		+9.9%		Equation 1 - d backling	rift
						backling	人.

Low 90 Drift (or 90D) formula gives Found - Tene (i.e., 5: gn of 90D)

is incorrect = a - 90D => 1056 of sonsitivity w/ + 20D => incorrect sonsitivity

this is apposite standard convention for 30D (True-Front)

- Surgles run immediatly ofter CCV 71580811 whice 50-03,5D-03ms,

SD-03msD, 5D-03 Deep, RB 6118, SD 06, SD-07 Deep, SD-07 Shallow, SD-05 Deep

and SD DS Shallow. Channel A, Tmx-1890; at-8HC-1620, X-8HC-1620, Enclain

Aldehyd 1790; Methoxygether-1620 + Endrin Return 1790- All others on channel

A + Average 90D OK. Analytin listed above on channel B were aboo >= 1580D.

*Action: Results for a-Bric, S-Bric, Endrin Aldehyde, Methoxychic + Endrin Ketace

qualified as estimated (147) in SD-03, SD-03 Deep, SD-06, SD-07 Deep, RB 6/18,

SD-07 Shallor, SD-05 Deep + SD-05 Shallow due to non-employed Coalibration

verification.

Continued a next page

Additional Notes:	us:	ra lab's convention de
Pest. CCV 71680811	6	70D calentation
4,4'-DOT Channel A==Z490D; Channel B	= 229	<u> </u>
Enchin Aldehyder Channel A== 1680; Channel B=		
Methoxychia Channel A = 726 % Channel B =		
Endrin Ketare Channel A = 1916 Channel B =	20%1)
This CCV is ansociated with Single: RB6	21 , F	18 6/22,
RB 6/23, 5D-2, SD-2 Dur, SD-01, SD-10.		
Action results for 4,4'-DDT, Endern Alduhyde, M	Mox	yehlr + Endin
Ketne qualified or ostimated (UI) in Single	انعلته	l'abare.
CCV Pest 71680812		
4,4'-DOT Channel A = -28% ; Channel B =	-1950	
Methoxychic Channel A: 2990; Channel B:	-291 ₀	· · · · · · · · · · · · · · · · · · ·
Endrin Ketze Chund 9=-2190; Channel R	<u>235</u>	<u> </u>
This CCV is associated with super: 50-11, 50-	8 + 3	D-9
Actim results of 4,4'-DDT, methorychlotend		L ·
as estimated ((i) ohn to non-complicant acu in	<u> SD-</u>	11,50-8-150-9.
CCV Pat 71680813 - ending calibration stud	ل	
4,4'-DOT Channel A = '-3290; Channel	B = -	229.
Methoxychir Chamel A = -35%; Channel &	: -:	34%
Endon Ketry Channel A: -25%; channel		
No Action taken since songle immediately pres	edin	were qualified
bused in CCV 71680812		•
		2,21. The
7 PCB CCVs all within ± 15% D for ARIO	16, 15k	ciaco, imx+

7 PCB CCVs all within ± 15% D for AR1016, AR1260, TMX+
0CB Surroguts - No action required.

H should be noted that original Pesticide CCV'S submitted with improper curve calibration on ICAL were within better control. After reprocusing of data, 910's exceeded = 15%.

5. Laboratory and Field Blank Results

Laboratory and field blank results are reviewed to assess the presence of contaminants, which affect the accuracy and sensitivity of the results. See Table Ia, where the Holding Time and Associated QC Table was completed for the samples within this SDG.

Was each sample analysis associated with the appropriate method blank, ie., correct matrix, correct matrix level, same extraction batch? Yes No. If no, list below affected samples. Were Cleanup Blanks analyzed? Yes / No. NA.

Review the reporting forms for each method and field blank. Were any target compounds in the method blanks detected at concentrations above the Reporting Limit (RL)? Yes (No.)

Action: - Blanks should not contain contaminants above the. The Blank Action Level is defined as five times the highest level seen in any of the matrix-matched blanks associated with this SDG. The following actions should be taken if conditions warrant:

- If the blank is not matrix matched, qualify all sample data, for the contaminant associated with this blank, with BB or EB, as appropriate.
- 10. If the reported result in a sample is below the reporting limit (sample < RL) and if a matrix-matched blank contains a result above the quantitation limit (blank > RL), the result in the sample should be negated (U) and raised to the sample-specific RL for that sample
- 11. If the sample result is between the reporting limit and the blank Action Level (RL < sample < Action Level), the result for the sample is negated (U) at the level found in the sample. Based on the level of contamination suspected in the sample, the reporting limit may be elevated. Professional judgment will be used in assessing the action needed.</p>
- 12. If the sample result is greater than the RL and the blank Action Level, no action is taken.

Comments: Blanks evaluated:	No Field	blanks were collected with the surface nature
Highest Blank: Action taken:		No Black Action Regulard. for Sediments only.
Sample ID	Compound	Reported Result Result based on Blank Action
		12/9/99
	<u> </u>	

6. Surrogate Spike Recoveries

The surrogate spike recoveries are reviewed to assess the accuracy of the results relative to laboratory performance and specific sample matrix.

Review the Surrogate Recovery information for each field and quality control sample. For one sample, verify that the recoveries reported correspond to the raw data and that the recovery calculation was done properly. Were the recovery data reported properly? Yes No.

Were the surrogate recoveries within QAPP defined and method-generated accuracy limits? (Yes) No. If no, were the affected samples reanalyzed? Yes / No. Did the chromatography of the affected samples show interferences? Yes / No. Was the retention time (RT) of the surrogates within criteria (Tetrachlorom-xylene within \pm 0.05 min and Decachlorobiphenyl \pm 0.10 min from average RT of surrogate from ICAL)? (Yes) No. List below the affected samples.

Action – Professional judgment must be used in qualifying data for Pesticides/PCBs based upon the surrogate recoveries. If recovery is outside of criteria on one column, but acceptable on the other, and all quantitative results are obtained for the samples on the second column, then qualification of the data may not be required. If quantitation is reported for a particular column, and surrogate recoveries are outside of criteria, the following actions may be taken: if 10% < % Rec < Lower Acceptance Limit, qualify detected and non-detected results as estimated (J and UJ); if <math>% Rec > Upper Acceptance Limit estimate detected results (J), no action required for non-detects; if <math>% Rec < 10%, estimate (J) positive results and reject (R) non-detects. A review of the data for both columns, comparing sample chromatograms to standard chromatograms, must be done and professional judgment must be used to determine if action is warranted. List below the affected samples and required actions.

Comments:

Sugh 50-07 Day TMX 90 Ric on Channel A+ B different by 56 30 RPD Both Recovering otill within QMPP critical.
Both lecarin still within QMPP culture.
All Surregula within oritoria - no action lequired.

New Environmental Horizons, Inc.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recovery and Precision

The matrix spike/matrix spike duplicate (MS/MSD) recoveries are reviewed to assess the accuracy of the results relative to the specific sample matrix and the relative percent differences (RPDs) are reviewed to assess the precision of the results relative to the specific sample matrix.

Review the unspiked sample, Matrix Spike, and Matrix Spike Duplicate—(MS/MSD) raw data and recovery results. Were the recoveries for the MS/MSD calculated properly? (Yes) No.

Did the laboratory perform MS/MSDs for each matrix and matrix level analyzed for each analytical batch prepared for analysis? Yes / No. If no, list below the affected samples. - MS (MSD and requested)

Were the MS/MSD recoveries and precision within QAPP and method-generated accuracy limits Yes/No. Were the RPDs between the MS/MSD within the QAPP precision criteria? Yes No. If no, list below the affected compounds.

Was the %RSD for non-spiked compounds in the unspiked sample, MS and MSD ≤ 50%? Yes / No (NA)

Action: No action is taken to the entire data set based on MS/MSD results alone. The unspiked sample may be qualified based on MS/MSD results as follows: if the MS/MSD recoveries were greater than the upper accuracy limit, estimate (J) positive results due to potential high bias; no action is required for non-detect results; if the MS/MSD recoveries were below the lower accuracy limit but above 10%, estimate (J and UJ) positive and non-detect results due to potential low bias; if a MS/MSD compound was recovered below 10% or not at all, estimate (J) positive results due to potential low bias and evaluate the non-detected results to determine whether estimation (UJ) or rejection (R) of the unspiked sample data is warranted. If the RPD between the MS and MSD > QAPP criteria, estimate (J and UJ) positive and non-detected results in the unspiked sample. If the %RSD, for a non-spiked compound, between the unspiked sample, MS, and MSD >50%, estimate (J) positive results and use professional judgement to qualify other detected and non-detected analytes.

Comments: Extration infrontly inclicates that ms/ms/d down in Pesticide - no PCPs (would have caused interference with analysis).

Lab's ms/ms/D 22 Rec criteria - tighter than QATPP for all analysts but

2-8HC + Aldrin (slightly lower acceptance). RPD though for lab sect at

5020 limit - did not use QATPP RPD ariters - lab contracted on 10/13/199

and validate infront that 50% RPD was historically Chosa - not statistically derived. Therefore, evaluation made of PPD vs. QATP ovitate (not lab)
ms/ms/D &PDs DK except for Heptachlor 38% (522% criteria) +

X-8HZ 24% (£15% criteria)

* Action: Results of Heptachlor and X-BIK qualified as estimated (ut)
in 50-03 (unspilled single) due to Precision objective not being met.

12- Pest/PCB

8. Laboratory Control Sample and Standard Reference Material Analysis

The Laboratory Control Samples (LCS) and/or Standard Reference Material (SRM) are reviewed to assess the accuracy of the results relative to the analytical procedure.

Review the raw data and recovery information for the LCS/SRM.

Did the laboratory perform a LCS or SRM for each matrix and matrix level analyzed? Yes No. If no, list below the affected samples.

Were the LCS or SRM recoveries within QAPP and method-generated accuracy requirements for recovery? Yes No. If no, list below the affected compounds.

Action: If the LCS or SRM recoveries are above criteria, estimate (J) positive results due to potential high bias, no qualification of non-detected results is necessary. If the LCS or SRM recoveries are between 10% to the lower recovery limit, estimate (J and UJ) positive and non-detect results for the samples associated with the analytical batch due to potential low bias in the results. If the recovery in the LCS or SRM is less than 10%, estimate (J) positive results due to low bias and reject (R) non-detect results due to potential false negatives.

Comments:

PW0623LI + PW0625LI for Pest all OK (90 Rec also within QAPP of	
	wite-1
PW0623LI + PW0625LI for PCBs OK - Used AR 1660 Spike instead	
of ARIZTY - more representative of runge of PCBs => Acceptable.	
A) - (4	
No action required.	

9. Pesticide Cleanup Checks

Where cleanup protocols used on the Pesticide/PCB extracts? Yes (No.) If yes, what cleanups were used and what QC was generated to verify the adequacy of the cleanup:

Cleanup Protocol	QC Activities
	L <u></u>

Were all samples and QC from the original extraction put through the cleanup protocols? Yes/ No. (NA Were there any QC results which indicated that the cleanup was not adequate? Yes / No.



Action: If a QC sample, for example Method Blank or LCS, demonstrates unacceptable results (e.g., contamination or loss of analytes of interest), the data associated with these QC samples may require qualification based on professional judgment.

Cor	mment	3 .										
	No	dear	ung c	la.	40_1	ourfre	· Wat	tus -	Noa	<u>ctim</u> i	require	<u>人</u>
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		<u> </u>										
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					· -				-			
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10. Sample Quantitation Limits

Review raw data and reporting forms. Did the sample-specific RLs meet the QAPP criteria? Yes No. Did the laboratory accurately adjust sample reporting limits to account for sample specific preparation and analysis conditions? Yes No.

Were all components reported in the samples quantitated within the calibration region of the instrument for the detected analytes? Yes/No Were the relative retention times for all components reported within the retention time windows established during initial calibration? Yes/No (N)

if the sample analyses were performed at dilutions, were more concentrated analyses performed or was sample screening information included in the data package? Yes / No (NA)

Were sample dilutions appropriate relative to scaling of the chromatograms and the calibration levels employed (e.g., peaks of interest within upper half of the chromatogram and quantitation done within the calibration range)? Yes / No. (NA)

Action - If the quantitation limits for non-detect results are lower than the lowest calibration standard, or if a positive result is detected outside of the calibration range, estimate positive and non-detected results (J and UJ).

Comments:

No dilutions parformed. No action Required.
Muthoryche QAPP RL was 0.05 mg/L 50-04 RL = 0.05 lug/L;
50-8 0.053 mg/L + 50-9 - 0051 mg/L - This increase in PL
we due to limited ough value for extrador.
J U

11. Field Duplicate Precision

Comments:

Field duplicate samples are reviewed to assess representativeness of the sample aliquot to the area sampled and the precision of the results relative to field sampling techniques.

Review analytical results for the duplicate sample analyses.

Action: If field duplicate precision exceeded 30% RPD for aqueous samples or 50% RPD for sediment or biota samples for any compound, estimate (J and UJ) positive and non-detect results for the affected compounds in both samples. If severe imprecision was noted in the field duplicate sample (i.e., RPD >100%), qualify the remainder of the associated field sample data based on sound technical judgment.

Field Duplicate Samples:	SD-2 Dup
- Pesuers for Pesticides + PCBs in Therefore precision was not able	both singles were non-detect; to be assessed.

12. Additional QA/QC Issues

Were the percent solids for the samples >30%. Yes / No (NA.)

List any additional issues which may affect the quality of the results. List the affected samples, QA/QC issue, and necessary actions taken in the comments section below.

Action: If the %solids were between 10% and 30%, qualify positive results as estimated (J) and reject non-detected results (R). If the %solids were < 10%, reject (R) positive and non-detected results.

No additional QA/OC	Issus noted other than Sagh Date on
	incorrect for soveral single. The Soupe
dute was carrected	during this assessment.
)

IVC. Example Sample Calculations

RL /

Review of one sample per data package is performed to	determine if sample results and quantitation limits were
correctly calculated and reported.	

W 11	outy entoured and reported.
San	was selected for review in this data package.
A.	Form 1 Review
1.	Were the Form 1s for completed according to the method/QAPP requirements? Yes No. If no, list below the affected fields.
2.	Reproduce the reporting limit for Pesticides/PCBs in one of the samples, did the laboratory correctly calculate the quantitation limits? Yes No. If no, list below.
D.	Quantitation Review: RL: 4 x 910 = 0.009 Ag/L - Labour 0.0088
Rep	roduce a calculation for one pesticide/PCB analyte in one of the samples that contained a positive result and pare the calculated result to the result reported by the laboratory.
	Analyte Checked:
	Laboratory Result: Calculated Result:
	Example Calculation:
	No detected Pesticide n PCB reput 1 12 SDG =>
	Calculation check not possible other than to check

1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	U ·	_	,	- /	. سو ،			Sirfo	 100 \	Water - Ri	SUIT			ν
?lient Sample ID	(SD04) 50-0	Н		SD12) 50	7/12		SD-13	<u> </u>	1.5	SD-03		SD-03DEEP	1	1
Lab Sample ID	42547-1			42547-3		ļ .	42547-4		_	42551-1		42551-2		 -
Sample Date	06/17/99	Lab	DV	06/17/99	Lab	DV	06/17/99	Lab	DV	06/18/99 La	P DV	06/18/99	Lab	DV
Units	UG/L	Qual.	Qual	UG/L	Qual.	Qual	UG/L	Qual.	Qual	UG/L Q	ial. Qual		Qual.	
Analyte									· · · · · ·				 	
VOCs-8260 ₿												1		1
Chloromethane	2	Ų	UJ		2 U	W		2 U	IJ	2 U	u		2 U	u
Vinyl chloride	2	U	U		2 U	U		2 U	U	2 U	u		ΣU	U
Bromomethane	2	U	UJ		2 U	UJ		2 U	w	2 U	UJ		2 U	UJ ·
Chloroethane	2	U	U		2 U	U		2 U	u	2 U	u		2 U	U
Acetone	5	U	u		5 U	U		5 U	U	5 U	U		5 U	u
1,1-Dichloroethene	2	U	U		2 U	U		2 U	U	2 U	Ü		2 U	U
Carbon disulfide	2	U	U		2 U	U		2 U	U	2 U	U		2 U	U
Methylene chloride	5	U	IJ		5 U	W		5 U	w	5 U	W	 	5 U	UJ
rans-1,2-Dichloroethene	2	U	υ		2 U	U		2 U	U	2 U	U		2 U	U
1,1-Dichloroethane	2	U	U		2 U	U		2 U	U	2 U	บ		2 U	u
2-Butanone (MEK)	2	U	U		2 U	U		2 U	U	2 U	U		2 U	U
cis-1,2-Dichloroethene	2	U	u		2 U	U	1	2 U	U	2 U	U		2 U	U
Chloroform	2	υ	U		2 U	U		2 U	U	2 U	U		2 Ų	U
1,1,1-Trichloroethane	2	U	U		2 U	υ		2 U	U	2 U	U		2 U	u
Carbon tetrachloride	2	U	U	,	2 U	U	1	2 U	U	2 U	Ü		2 U	U
Benzene	2	IJ	U	<u> </u>	2 U	U		2 U	U	2 U	U		2 U	U
Trichiproethene	2	U	U		2 U	U		2 U	U	2 U	U		2 U	U
1,2-Dichloropropane	2	U	U	1	2 U	U		2 U	U	2 U	U	1 :	2 U	U
Bromodichloromethane	2	U	U		2 U	U		2 U	U	2 U	u	- 	2 U	U
Methyl isobutyl ketone (MIBK)	2	U	U		2 U	U		2 U	U	2 U	U		2 U	u
cis-1,3-Dichloropropene	2	U	u		2 U	U		2 U	U	2 U	U		2 U	U
Toluene	2	U	U		2 U	U		2 Ų	U	2 U	U		2 U	Ų
trans-1,3-Dichloropropene	2	U	U		2 U	U		2 U	U	2 U	u	1	2 U	U
1,1,2-Trichloroethane	2	U	U		2 U	U		2 U	Ų	2 U	U		2 U	Ų
2-Hexanone	2	U	U		2 U	U		2 U	U	2 U	u		2 U	u
Tetrachloroethene	2	U	U		2 Ų	U		2 U	υ	2 U	u		2 U	U
Dibromochloromethane	2	U	U		2 U	U		2 U	U	2 U	U		2 U	U
1,2-Dichloroethane		U	Ü		2 U	U		2 U	U	2 U	U		2 U_	U
Chlorobenzene	2	U	U		2 U	U		2 U	U	2 U	u		2 U	U
Ethylbenzene	2	U	U		2 U	U		2 U	U	2 U	U		2 U	U
p/m-Xylene	4	U	U		4 U	U		4 U	U	4 U	U		U	U
o-Xylene	2	U	U		2 U	U		2 U	U	2 U	U		2 U	บ
Styrene	2	U	U		2 U	U		2 U	U	2 U	U		2 U	u
Bromoform		U	U		2 U	U		2 U	U	2 U	U		2 U	U
1,1,2,2-Tetrachloroethane	2	U	u	L	2 U	u		2 U	U	2 U	U		υ	υ

Client Sample ID:	TRIP BLANK		1	SD-06		 	SD-07DEEP		· · · · ·		<u>~ </u>	٠ مو		- - 	
Lab Sample ID:				42551-5	 -	 i	42551-6		-	SD-07SHALLOW	 		SD-05DEEP		
Sample Date:		Lab	DV	06/18/99	1 - 1	C14				42551-7			42551-8	ļ	1
			Qual	UG/L			06/18/99 UG/L	Lab		06/18/99	Lab	DV	06/18/99	Lab	DV
nalyte	OCIC	Quai.	Qual	UG/L	Quai.	Qual	03/L	Qual.	Qual	UG/L	Qual.	Qual	UG/L	Qual.	Qual
OCs-8260 B		~	<u> </u>										 		
hioromethane	9	J	U	2	U	U		11			16.0	44			
nyl chloride			U		U	U		Ú	Ŋ		U	U		U	u
romomethane) 	UJ i	 	U	UJ .	 	U	UJ.		U	ΩJ Ω	3		
hloroethane		U	U		U	U		U	U		U	U		U	ีนา .
cetone	5		J		J	u .		J	U ·		U	U	 	U	U
,1-Dichloroethene		ט	u	 	u	U		U	U		U	Ü	} _	u	U
arbon disulfide	}	Ü	Ū		U	U		U	u		U	U		U	U
1ethylene chloride		Ü	nı	}	U	w		U	บม	~ ~~	U	nn n		U	in l
ans-1,2-Dichloroethene		U	υ	 	U	U		U	U	·	U	U		יט	03
,1-Dichloroethane		U	U		υ	u		U	U		U	U	 	U	
:-Butanone (MEK)		U	U		U	U	· · · · · · · · · · · · · · · · · · ·	U	U		U	U	·	U	U
is-1,2-Dichloroethene	}	U	U	2		1	6		ļ	2	+	<u> </u>	13	 -	
Chloroform	t	J	j .		U	U	 	U	U		U	U		2 U	U
1,1,1-Trichloroethane	2	U	U		U	U	 	Ü	U		U	U		2 U	U
Carbon tetrachloride	2	v	U	2	U	U		U	U		U	U		2 U	U
Benzene	2	U	Ų	2	U	U	63			 	U	U	190		1
Trichloroethene	2	U	Ú	2	j	J	2	Ĵ	J		J	J	1	,	
1,2-Dichloropropane	2	U	Ų	2	U	U	2	Ų	U	2	U	U	1	2 U	U
Bromodichloromethane	2	U	U	2	U	U	2	U	U	2	U	U	2	2 U	U
Methyl isobutyl ketone (MIBK)	2	U	U	2	U	U	2	υ	U	2	u	U	2	U	U
cis-1,3-Dichloropropene	2	د	υ	2	U	U	2	U	U	2	U	U	2	U	U
Toluene	2	J	U	4		<u> </u>	2	U	U	2	IJ	U	2	U	U
trans-1,3-Dichloropropene	2	U	Ú	2	U	Ų	2	U	U	2	υ	U	2	Ų	U
1,1,2-Trichloroethane	2	U	U	2	U	U	2	บ	U	2	υ_	U	2	יט	U
2-Hexanone	2	U	U	2	U	U	2	U	U	2	U	U	2	U	υ
Tetrachioroethene		U	U	2	U	u	2	U	U	2	U	U	2	U	U
Dibromochloromethane		U	U	2	U	U	2	U	U	2	U	U	2	U	U
1,2-Dichloroethane	2	U	U		U	U	2	U	U	2	U	U	2	U	U
Chlorobenzene			U			U	1	J	J	2	U	U	4		
Ethylbenzene	2	U	U		U	U	2	U	U	2	U	U	2	ט	U
p/m-Xylene			U		U	u	4		υ	4	U	U	2	J	J
o-Xylene			U	2	U	U	2	U	U	2	U	U	7	U U	U
Styrene	2	U	U	2	U	U	2	U	U	2	U	U	2	U	U
Bromoform	2	U	U	2	U	U	2	Ú	U		U	U	2	u	Ų
1,1,2,2-Tetrachloroethane	2	U	υ	2	U	U	2	U	U	2	U	U	2	U	U

Hent Sample ID:	SD-05SHALLOW	Γ.	F .	(SD-2) 3D.	12	7	2DUP)	10-02	500	SD-01	T	ļ ———	SD-10	, ,	, , ,
Lab Sample ID:	42551-9	1	 	42574-1		 	142574-2	4D-VE	77	42574-3	 		42574-4	+	
Sample Date:		Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV
Units	UG/L	Qual.	 	UG/L	Qual.	Qual	UG/L	Qual.	Qual	UG/L	+		UG/L	Qual.	Qual
Analyte		-	 	. ,			Field Di						00/2	Guai.	- Cardon
VOCs-8260 B										· · · · · · · · · · · · · · · · · · ·	1			+	
Chloromethane	7	U	U	2	U	U	2	U	U		2 U	U		2 U	U
Vinyl chloride	7	U	U		2 13	U		U	U		2 U	U		2 U	U
Bromomethane	2	U	UJ ·	2	2 U	UJ ·		U	UJ .	 	2 U	W.		2 U	UJ
Chloroethane		Ų	U	2	! U	UJ ·	2	U	W		2 U	W		2 U	W
Acetone	5	J	U	5	U	U	5	JB	U ·		5 U	U		5 U	U
1,1-Dichloroethene	2	υ	U	2	U	U	2	U	U	1	2 u	U		2 U	u
Carbon disulfide	2	U	U	2	U	IJ		U	W ·	 	2 U	UJ ·		2 U	W.
Methylene chloride		U	ŲĴ	5	U	UJ .	 	U	IJ		5 U	IJ		5 U	UJ
trans-1,2-Dichloroethene	2	V	U	2	U	U	 	U	υ		2 U	U		2 U	U
1,1-Dichloroethane	2	U	Ų	2	2 U	Ų	 	U	U		2 U	U		2 U	U
2-Butanone (MEK)		U	U	 	U	U		U	Ų	 -	2 U	U		2 U	U
cis-1,2-Dichloroethene	2			2	U	U		U	U		2 U	υ	·	2 U	U
Chloroform	7	U	U	2	U	U	2	U	U		2 U	U		2 U	U
1,1,1-Trichloroethane	. 2	U	U	2	U	U	2	U	υ	••	2 U	υ		2 U	U
Carbon tetrachloride	2	U	υ	2	! U	U	2	U	U		2 U	U		2 U	U
Benzene	2	U	U	2	U	U	2	U	U		2 U	U		2 U	U
Trichloroethene	2	J	J	2	U	บ	2	U	υ		2 U	U		2 U	u
1,2-Dichloropropane	2	u	U	2	U	U	2	U	U		2 U	U		2 U	U
Bromodichloromethane	2	U	U	2	U	U	2	U	u		2 U	U		2 U	U
Methyl isobutyl ketone (MIBK)	2	U	U	2	U	U	2	U	U		2 U	υ		2 U	U
cis-1,3-Dichloropropene		U	U	2	U	u	2	U	U	;	2 U	U		2 U	U
Toluene		U	U	† 	U	U	2	U	U		2 U	υ		2 ∪	U
trans-1,3-Dichloropropene		U	U		U	u		U	U		2 U	υ		2 U	U
1,1,2-Trichloroethane		U	U		U	U		U	U		2 U	U		2 U	U
2-Hexanone	 	U	U		! U	U		! U	U		2 U	U		2 U	U
Tetrachloroethene		U	U		! U	U	· · · · · · · · · · · · · · · · · · ·	U	U		2 U	U		2 U	U
Dibromochloromethane	· · · · · · · · · · · · · · · · · · ·	U	U		U	U		U	U	•	2 U	U		2 U	U
1,2-Dichloroethane		U	ļυ		!U	U		U	U		2 U	u		2 U	U
Chiorobenzene		U	U		· 	U		U	U		2 U	U		2 U	U
Ethylbenzene		U	U		U	U		U	υ		2 U	U		2 U	u
p/m-Xylene		U	U		U	U		U	U		4 U	U		4 U	U
o-Xylene		U	U	-	U	U		U	U		2 U	υ		2 U	U
Styrene		U	U		U	U		U	U		2 U	Ų		2 U	U
Bromoform		U	U		U	U		u	U		+	U		2 U	U
1,1,2,2-Tetrachloroethane	2	U	U	[2	U	U	2	ļu	U		2 U	U		2 U	U

Client Sample (D:	SD-11		(SD-8) 5D-	08	(SD-9) 51	-09	· · · · ·
Lab Sample IO:	42574-5			42575-1			42575-2		
Sample Date:	06/21/99	Lab	DV	06/22/99	Lab	DV	06/22/99	Lab	DV
Units	UG/L	Qual.	Qual	UG/L	Qual.	Qual	UG/L	Qual.	Qual
nalyte								-	
OCs-8260 B									
hloromethane	2	U	U	2	U	U	2	υ	U
inyl chloride	2	υ	u	2	U	U	2	U	U
romomethane	2	U	UJ .	2	U	UJ		U	UJ
hloroethane	2	U	UJ	2	Ų	UJ ·		υ	W.
cetone	5	υ	IJ		Ų	U		JB	U ·
,1-Dichloroethene	2	U	U	2	U	U		U	U
arbon disulfide	2	U	UJ	 	U	UJ		U	UJ
lethylene chloride	5	U	WJ		U	นม		u	υJ
rans-1,2-Dichloroethene	2	ט	U	2	U	u	+	u	U
,1-Dichloroethane	2	U	U	2	U	U	2	U	u
?-Butanone (MEK)	2	U	U	2	U	U	2	υ	U
sis-1,2-Dichloroethene	2	U	U	2			1	J	J
Chloroform	2	U	U	2	υ	U	2	U	U
1,1,1-Trichloroethane	2	U	U	2	U	U	2	U	U
Carbon tetrachloride	2	U	U	2	U	U	2	U	υ
Benzene	2	u	Ü	2	U	U	2	u	U
Trichloroethene	2	U	U	_ 2	J	J	2	U	U
1,2-Dichloropropane	2	U	U	2	Ų	U	2	U	Ų
Bromodichloromethane	2	U	Ų	2	Ų	U	2	U	U
Methyl isobutyl ketone (MIBK)	2	U	U	2	U	U	2	U	U_
cis-1,3-Dichloropropene	2	U	Ų	2	u	Ų	2	U	U
Toluene	2	U	U	2	U	u	2	u	U
rans-1,3-Dichloropropene	2	U	Ü	2	U	U	2	U	Ų
1,1,2-Trichloroethane	2	U	U	2	U	U	2	U	U
2-Hexanone	2	U	U	2	U	U	2	Ų	U
Tetrachloroethene	2	U	U	2	U	υ	2	U	U
Dibromochloromethane	2	U	U	2	U	V	2	U	υ
1,2-Dichloroethane	2	U	U	2	U	U	2	U	U
Chlorobenzene	2	U	U	2	U	U	2	u	U
Ethylbenzene	2	U	U	2	U	U		u	U
o/m-Xylene	4	U	u	4	U	U	4	U	U
o-Xylene] 2	U	U	2	U	U	2	U	U
Styrene	2	U	U	2	U	U	2	U	U
Bromoform	2	U	U	2	U	U	2	U	U
,1,2,2-Tetrachloroethane	2	U	U		U	U	2	U	U

NEH, Inc. 4 of (

Client Sa	mple ID:	SD04) 5	10-04	Ţ	RINSE BLANK			3 3	1-12]	so-13		· · · ·	SD-03		T
Lab Sar	mple iO:	42547-1			42547-2	1	<u> </u>	42547-3			42547-4	1	 	42551-1	1	1
Samp	e Date:	06/17/1999	Lab	DV	06/17/1999	Lab	DV	06/17/1999	Lab	DV	06/17/1999	Lab	DV	06/18/99	Lab	DV
	Units	ug/L	Qual.	Qual.	ug/L	Quai.	Qual.	ug/L	Qual.	Qual	ug/L	Qual.	Quai.	ug/L	Qual.	Qual
Analyte		_														
SemiVOCs-8270				Ţ	ļ				T							1
bis(2-Chloroethyl)ether			4 U	Ų		U	U	4	U	Ų		U	U	4	U	Ü
Phenol			4 U	U	4	U	U		U	U	 	U	U	+	U	Ū
2-Chlorophenol	-		4 U	U	4	u	U		U	U		U	U		Ü	U
1,3-Dichlorobenzene			4 U	U	4	U	U	4	U	U	 	Ü	U	1	U	U
1,4-Dichlarobenzene			4 U	U	4	U	U	-	U	U		U	U	1	U	U
1,2-Dichlorobenzene			4 U	U		U	U	-	U	U	 	Ü	U	 	U	Ū
bis(2-chloroisopropyl)ether			4 U	Ų		U	υ	 	U	Ū		U	U	 	U	U
Hexachloroethane		· · ·	4 U	U		ıU	U	 	U	Ū		U	U	 	U	U
N-Nitroso-di-n-propytamine			4 U	U		ιU	U	 	U	u		U	lu		u	U
Nitrobenzene			4 U	u		ilu	U	 	U	U	 	U	U	1	U	u
sophorone	~-		4 U	U		U	Ų	· · · · · · · · · · · · · · · · · · ·	U	Ū.		U	U	<u> </u>	u	U
2-Nitrophenol			4 U	u	 	U	U	· · · · · · · · · · · · · · · · · · ·	U	lu -		u	u	 	U	U
2,4-Dimethylphenol			4 U	U	 	U	U	 	U	l ū		ü	U	1	U	Ü
bis(2-Chloroethoxy)methane			4 U	U		l U	Ū	 	U	u	 	U	U	 	U	Ū
2,4-Dichlorophenol			4 U	U	† ··	ıU	Ū	 	U	U		U	u	 	υ	U U
1,2,4-Trichlorobenzene			4 U	U		U	U	 	U	U U	 	U	U		U	U
Naphthalene			4 U	U	}	U	U U	 	U	lu		U	ח ו		U	U
Hexachlorobutadiene			4 U	บม	 	ı	w w	}	U	w w		i U	UJ	 	U	UJ
4-Chloro-3-methylphenol			4 U	U	 	ı U	U	 	U	U U	 	i U	Ů,		U	n 03
Hexachlorocyclopentadiene			0 0	UJ		ΙU	w	 	U	luj Luj	 	u u	lnn Ln		U	nn n
2,4,6-Trichlorophenol		· · · · · · · · · · · · · · · · · · ·	4 U	u	 	U	u -	 	U	U		Ü	lu Iu	 	υ	U
2-Chloronaphthalene			4 U	Ū.	 	U	U		U	U	 	. U	U -	 	U	U
Acenaphthylene			4 U	U	<u> </u>	U	U	 	U	U		i u	U	 	U	U
Dimethylphthalate		· · · · · · · · · · · · · · · · · · ·	4 U	U		ιυ	υ –	 	U	U		u	U	 	U	Ü
2,6-Dinitrotoluene			4 U	U		i u	u	 	U	lu	 	i u	u	1	u	U
Acenaphthene			4 U	U	 	i U	U	†~ ~~	ılu	U	 	s u	0	 	lu —	15
2,4-Dinitrophenol			0 U	UJ		Ū	w	 	U	in in		2 U	UJ		u	nn n
2,4-Dinitrotoluene			4 U	U		ı U	U		U	U	T	บ	U		u	U
4-Nitrophenol			0 U	u		ı U	U -		U	U	+	2 U	U	 	U	u -
Fluorene			4 U	U		ŧ U	u		iu	U		, U	U	1	U	U
4-Chlorophenyl-phenylether			4 U	U	·	ı U	Ů		lu	ů		υ	u		U	u
Diethylphthalate			4 U	U	 	U	Ü		Ū	Ū.		U	l u		U	U
4,6-Dinitro-2-methylphenol			0 U	UJ		ı U	w	 	U	UJ		ט	UJ	† · · · · · · · · · · · · · · · · · · ·	U	ΩJ
n-Nitrosodiphenylamine			4 U	u	 	ıu	U		U	u		U	u		U	U U
4-Bromophenyl-phenylether			4 U	U	· 	ıu	U	 	U	U	 	U	U		U	U

Client Sample ID(SD04) 50	1-04		RINSE BLANK	T		SD12) 51	J-12	1	ISO-13	T	 	ISD-03	, , ,	1/3
Lab Sample ID:				42547-2	<u> </u>	 	42547-3		 	42547-4		 -	42551-1	-	
Sample Date:		Lab	DV	06/17/1999	Lab	DV	06/17/1999	Lab	OV	06/17/1999	Lab	DV	06/18/99	1 -	DV
Units		Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual	ug/L	Qual.	 	ug/L	Lab Qual.	Qual.
Analyte		-			 						-	Talana.	ugg-t-	Gual.	Quai.
SemiVOCs-8270							 	+		 -		 	 -	 	
Hexachlorobenzene	4	U	U	4	U	U		U	U	5	U	U		U	u
Pentachlorophenol	10		u	11	+	Ü		U	U U		U	u -		U	<u>.</u>
Phenanthrene	 	U	u	}	U	U		u	u		U	l u		U	u
Anthracene	4	Ų	U	 	U	U		ıU	u		U	lü—		U	u -
Di-n-butylphthalate	4	U	U	6		 		U	u		U	u		u	u
Fluoranthene	4	U	U		U	U		U	U		U	U	 	Ü	lu l
Pyrene	4	U	U	4	 -	U	 -	ıu	U		U	U		υ	U
Butylbenzylphthalate	4	u	U	4	U	U		U	U		U	U		U	u
3,3'-Dichlorobenzidine	4	U	U	4	U	U		IU	U		υ	U		U	i u
Benzo[a]anthracene	4	U	U	4	U	U		U	U	 	U	υ		U	u
Chrysene	4	U	U	4	U	Ü	 	U	U	1	U	U		U	lu
bis(2-Ethylhexyl)phthalate	4	U	U		u	U		U	u		U	ĺυ		u	Tu -
Di-n-octylphthalate	4	U	U	 	U	U	 	U	U		U	υ	<u> </u>	U	u
Benzo[b]fluoranthene	4	U	U	 	U	u		U	u	 	U	U	 	Ū	u
Benzo[k]fluoranthene	4	U	U	4	U	u	1	U	u		U	Ü	 	U	u
Berizo[a]pyrene	4	U	u		U	U		U	U	1 	U	U		U	U
Indeno[1,2,3-cd]pyrene	4	Ú	U	4	U	u		U	Ū		U	U	 	U	U
Dibenz[a,h]anthracene	4	U	U	4	U	U	4	ıU	U		U	U		U	U
Benzo[g,h,i]perylene	4	U	U	4	U	U	4	U	U		U	Ū	 	U	Tu -
2-Methylphenol	4	U	U	4	U	u	4	ıυ	U	5	U	Ū		U	U
4-Methylphenol	4	IJ	U	4	U	U	4	ıu	U	5	U	U		U	U
4-Chloroaniline	4	U	U	4	U	u	4	U	U	5	U	Ū	 	U	U
2-Methylnaphthalene	4	Ų	U	4	U	Ų	4	U	U	5	U	Ū	1	U	U
2,4,5-Trichlorophenol	10	U	U	11	Ų	U	10	u	Ü		U	U	 	U	Ü
2-Nitroaniline	10	U	U	11	Ų	u	10	u	U		U	U	 	U	U
3-Nitroaniline	4	υ	U	4	U	u	4	U	U	+	U	lu	 	U	Ū
Dibenzofuran	4	U	Ų	4	U	U	4	U	U		U	Ū	 	U	U
4-Nitroaniline	10	U	U	11	U	U	10	U	U		U	v	 	U	U
Carbazole	4	υ	υ		U	U	 	u	lu		U	u	4	Ū	u

NEH, Inc. 2 of 10 (

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Client Sample ID:				RINSE BLANK			-06			SD-07DEEP			SD-07SHALLOW] _
Lab Sample ID:				42551-3			42551-5			42551-6			42551-7		1
Sample Date:		Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	OV
Units	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.
Analyte															T
SemiVOCs-8270					_	L							ļ		
bis(2-Chloroethyl)ether	4	U	U	4	U	u	5	U	U	4	U	U		U	Ų
Phenol	4	Ų	U	4	5	U	5	U	U	4	U	U		U	u
2-Chlorophenol	4	U	U	4	J	U	5	U	U	4	U	U		U	u
1,3-Dichlorobenzene	4	บ	U	4	C	v	5	U	U	4	U	U		U	Ū
1,4-Dichlorobenzene	4	υ	U	4	U	U	5	U	U	4	U	U		U	U
1,2-Dichlorobenzene	4	U	U	4	U	U	5	U	U	4	U	U		U	U
bis(2-chloroisopropyl)ether	4	U	U	4	U	U	5	U	U	4	U	U		U	u
Hexachloroethane	4	U	u	4	U	U		U	υ	 	υ	U		U	u
N-Nitroso-di-n-propylamine	4	U	U	4	U	U		U	Ū		U	υ	 	U	lu
Nitrobenzene	4	U	U	4	Ų	U	5	U	U		U	U		U	lu
Isophorone	4	U	U	4	V	u	5	U	U	}	U	U		U	lu -
2-Nitrophenol	4	Ų	Ų		U	U		U	u		u	U		U	u
2,4-Dimethylphenol	4	υ	u	4	V	U		U	U	 	Ū	U		U	1
bis(2-Chloroethoxy)methane	4	U	U		υ	υ		U	U		U	lu	· · · · · · · · · · · · · · · · · · ·	U	tu -
2,4-Dichlorophenol	4	U	U		U	U		U	Ü		Ŭ	υ	 	U	Ιŭ
1,2,4-Trichlorobenzene	4	U	U	4	J	Ų		U	lu -		U	U		U	ĺυ
Naphthalene	4	U	U	4	U	U	5	U	u	4	U	U		U	lu
Hexachlorobutadiene	4	U	UJ	4	U	w	5	U	W	4	U	w		U	ŲJ
4-Chloro-3-methylphenol	4	U	U	4	C	u	5	U	U	4	U	U		U	Ü
Hexachlorocyclopentadiene	11	υ	UJ .	11	U	UJ v	11	U	w.	11	u	υJ	11	U	UJ ,
2,4,6-Trichlorophenol	4	U	U	4	2	U	5	IJ	U	4	Ų	Ų		U	lυ
2-Chloronaphthalene	4	Ų	U	4	U	U	5	Ü	U	4	U	U		U	U
Acenaphthylene	4	U	U	4	C	U	5	υ	U	4	υ	U		U	U
Dimethylphthalate	4	U	U	4	٦	U	5	U	U	4	U	U		U	U
2,6-Dinitrotoluene	4	Ų	U	4	U	Ü	5	U	U	4	υ	U		U	U
Acenaphthene	4	U	U	4	5	U	5	Ų	U	4	U	U		U	U
2,4-Dinitrophenol	11	Ų	UJ	11	5	IJ	11	U	UJ	11	U	IJ	1:	U	UJ
2,4-Dinitrotoluene	4	U	Ų	4	U	U		U	U	 	U	U		ilu	u
4-Nitrophenol	11	U	U	11	Ų	Ü	11	U	U	11	U	U	11	u	Ū
Fluorene	4	U	U	4	Ų	U		U	U	 	U	U		ĪŪ	Ū
4-Chlorophenyl-phenylether	4	U	U			U		U	U	+	U	Ū	 	U	tu
Diethylphthalate	4	U	u			U		Ü	U		U	u		ıu	lu
4,6-Dinitro-2-methylphenol	11	U	UJ	11		w		U	m		u	w		U	UJ.
n-Nitrosodiphenylamine		U	U			U		U	U		U	U		U	u
4-Bromophenyl-phenylether		Ų	Ų			Ü		U	v		U	u	<u> </u>	U	U

4.011 UV 1110/2

Client Sample ID:	SD-03DEEP			RINSE BLANK			SD-06	1	1	SD-07DEEP			SD-07SHALLOW	,	
Lab Sample ID:	42551-2		 	42551-3	~	 	42551-6	+	 	42551-6		 	42551-7		} -
Sample Date:		Lab	DV	06/16/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV	06/18/99	1 -1	<u> </u>
Units	ug/L	Qual.		ug/L			ug/L	Qual.	 	ug/L			ug/L	Lab	DV
Analyte							-9-	-	GIOOI,		Quai.	Qual.	ugr	Qual.	Qual.
SemiVOCs-8270				<u> </u>				-	 			-	 		
Hexachlorobenzene	4	υ	u	4	U	U		5 U	U		U	U -		-	
Pentachlorophenol	11		u	11	-	Ů		ı U	U	11		U	 	υ	U
Phenanthrene		U	u		U	U		S U	υ U		u	U	11	U	u
Anthracene		U	U		U	υ		5 U	lυ	 	U	u	 	U	u u
Di-n-butylphthalate	 	บ	u		U	U		5 U	lu-		U	u		U	lu l
Fluoranthene		U	U		U	υ υ		5 U	U			u	 	U	lu l
Pyrene	4	U	U		U	υ	 	5 U	u		Ü	u		u	<u>.</u>
Butylbenzylphthalate	4	U	U		U	U		5 U	Ū		U	U		U	u
3,3'-Dichlorobenzidine	4	U	U		U	U	 	5 U	lu -	 	U	lu	 	U	u
Benzo[a]anthracene		υ	U		U	U	 	S U	U		U	lu	<u>-</u>	U	lu -
Chrysene	4	U	U	 	U	u	 	5 U	u		Ü	ĺυ —		U	u
bis(2-Ethylhexyl)phthalate	3	J	J	4	U	U		5 U	Ū		Ü	lu -	 	u	U -
Di-n-octylphthalate	4	U	U	4	u	u	 	5 U	U	1	U	lυ		U	u
Benzo[b]fluoranthene	4	U	V	4	IJ	u	 	5 U	u		Ū	lu	 	U	u
Benzo(k)fluoranthene	4	U	Ų	4	U	U	,	5 U	U	4	U	u	4	U	u
Benzo(a)pyrene	4	υ	U	4	U	Ū		5 U	U	4	U	Ū		U	U
Indeno[1,2,3-cd]pyrene	4	U	U	4	U	U		S U	v	4	U	U		U	U
Dibenz[a,h]anthracene	4	U	U	4	Ų	v	,	5 U	U	4	U	U	 	U	U
Benzo[g,h,i]perylene	4	U	U	4	Ų	v		5 U	u	4	U	U	4	U	U
2-Methylphenol	4	U_	U	4	U	U		5 U	Ų	4	U	U	4	U	U
4-Methylphenoi	4	U	U	4	U	U		5 U	U	4	U	υ	4	U	U
4-Chloroaniline	4	Ų	U	4	U	U		5 U	U	4	U	U	 	U	υ
2-Methylnaphthalene	4	U	Ų	4	U	U		5 U	U	4	U	U	4	U	U
2,4,5-Trichlorophenol	11	U	U	11	U	υ	11	1 U	u	11	U	U	11	U	U
2-Nitroaniline	11	U	U	11	U	U	11	ıU	U	11	U	U		U	U
3-Nitroaniline	4	U	U	4	U	υ		S U	U	4	U	U		U	u
Dibenzofuran	4	J	U	4	U	U		5 U	u	4	U	U	4	U	υ
4-Nitroaniline	11	U	U	11	U	υ	11	ıU	u	11	U	U	 	U	U
Carbazole	4	۲	U	4	υ	U		3 U	U		U	U	+	U	u

NEH. Inc. 4 of 19

Client Sample ID:	SD-05DEEP			SD-05SHALLOW		Τ	KINSE BLANK			RINSE BLANK A		T
Lab Sample ID:	42551-8			42551-9			42562-3			42563-9		
Sample Date:	06/18/99	Lab	DV	06/18/99	Lab	DV	06/21/99	Lab	DV	06/22/99	Lab	DV
Units	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.
Analyte									†			
SemiVOCs-8270									1			1
bis(2-Chioroethyl)ether	4	Ų	U	4	Ų	U	4	U	Ü	4	U	lu
Phenol	5			4	Ų	Ū	4	u	U	4	 -	Ū
2-Chlorophenal	4	υ	υ	4	U	U	4	U	u	4	U	u
1,3-Dichlorobenzene	4	U	U	4	U	U	4	U	lu		u	U
1,4-Dichlorobenzene	4	U	U	4	U	U	4	U	U	4	+	U
1,2-Dichlorobenzene	4	U	U	4	υ	U	4		U	4	+	u
bis(2-chloroisopropyl)ether	4	U	U		U	Ū	4	U	u	4		U
Hexachloroethane	4	U	U		U	Ū	4		U		+	Ū
N-Nitroso-di-n-propylamine	4	U	U		+	U		U	u	4	 -	Ü
Nitrobenzene	4	U	u		U	U		U	U	4	+	U
Isophorone	4	Ü	U	4	U	U	4	U	U	4	 -	U
2-Nitrophenol	4	υ	U		U	υ		U	u	4	+	u
2,4-Dimethylphenol	4	U	U	4	U	U		U	lu	4	 	u
bis(2-Chloroethoxy)methane	4	U	U	4	 	U		Ü	U	<u> </u>	U	ü
2,4-Dichlorophenol	4	U	U	 	U	U		U	Ū		U	u
1,2,4-Trichlorobenzene	4	U	U		U	Ū	4		Ů	4	 	u
Naphthalene	4	U	Ų	4	U	υ	4	 	lu	4	 -	U
Hexachlorobutadiene	4	U	W	4	 	w	4	U	luj	4	+	UJ
4-Chloro-3-methylphenol	4	Ų	U	4	U	υ		U	υ -	4		u
Hexachlorocyclopentadiene	11	U	UJ .	10	U	W.	10	U	lu		Ū	Ü
2,4,6-Trichlorophenol	4	U	U	4	U	lu		υ	U		U	u
2-Chloronaphthalene	4	U	U	4	U	U	4	u	lu	 	U	υ
Acenaphthylene	4	U	U	4	U	U	4	U	U	4	U	u
Dimethylphthalate	4	บ	U	4	υ	U	4	U	U	4	 	u
2,6-Dinitrotoluene	4	U	U	 	U	U	4	Ų	U	4	+	u
Acenaphthene	4	U	U	4		Ū		U	Ū	}	U	U
2,4-Dinitrophenal	11		UJ	10		w	10		UJ		U	UJ
2,4-Dinitrotoluene		U	U	4		U		U	u		U	U
4-Nitrophenol		υ	U	10		U	10		U		U	U
Fluorene	·	U	U	 	U	Ū		U	lu		u	lu
4-Chlorophenyl-phenylether		U	U		U	U		U	Ū	• • • • • • • • • • • • • • • • • • • 	U	Ū
Diethylphthalate		U	U	 	U	Ü		U	U		U	U
4,6-Dinitro-2-methylphenol	11	 -	UJ	10	 -	UJ	10		UJ		U	UJ.
n-Nitrosodiphenylamine		U	u		U	U		Ų	U		U	U
4-Bromophenyl-phenylether	 	U	U	 	U	U		U	U		U	U

	·	, .		·								
Client Sample ID:				SD-05SHALLOW			RINSE BLANK			RINSE BLANK A		
Lab Sample iD:				42551-9			42562-3			42563-9		
Sample Date:	06/18/99	Lab	DV	06/18/99	Lab	DV	06/21/99	Lab	DV	06/22/99	Lab	Ιον
Units	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Quai.	ug/L	Qual.	Qual.
Analyte			Ĺ									
SemiVOCs-8270												_
Hexachiorobenzene	4	U	U	4	U	U	4	U	U	4	U	lu
Pentachlorophenol	11	U	U	10	U	u	10		u		U	lu -
Phenantixene	4	U	U	4	U	υ		υ	U		U	lu -
Anthracene	4	U	U	4	U	U	4	U	U	\$ 	U	 -
Di-n-butylphthalate	4	U	U	4	Ų	U	4	U	U	24	 	
Fluoranthene	4	U	U	4	U	U	4	U	U	 	u	U
Pyrene	4	U	U	4	U	U	 	U	U	 -	U	u
Butylbenzylphthalate	4	u	υ	4	U	U	4	U	U	 -	U	li
3,3'-Dichlorobenzidine	4	U	U		U	Ū		U	U	 	U	U
Benzo[a]anthracene	4	U	u		U	U		U	Ū	f	U	u
Chrysene	4	U	u		U	lυ		u	υ		u	u
bis(2-Ethylhexyl)phthalate	4	U	U		U	U		U	U	 	U	lu -
Di-n-octylphthalate	4	Ü	u		U	U	 	u	U	 	U	u
Benzo[b]fluoranthene	4	U	U		U	U	+	u	U	4	U	lu
Benzo(k)fluoranthene	4	U	U	, 	U	U	}	u	Ū	-	U	u
Benzo[a]pyrene	4	U	u		U	Ū		U	U	4	U	Ū
Indeno[1,2,3-cd]pyrene	4	U	u		U	υ	 	U	U	 	u	u
Dibenz[a,h]anthracene	4	U	U	 	U	U		U	U		U	l u
Benzo[g,h,i]perylene	4	U	lu -	4	U	lu -]	U	Ü		u	l <u>u</u>
2-Methylphenol	4	U	U	4	U	u	 	U	U	 	u	Ū
4-Methylphenol	4	U	U	4	U	U		U	Ü		U	lu
4-Chloroaniline	4	u	U	 	U	U	 	U	U	 	U	U
2-Methylnaphthalene		U	U		U	U	 	U	U	 	U	lu
2,4,5-Trichlorophenol	11		U	10		ū	10	· ·	U	I	U	U
2-Nitroaniline	11		U	10		u	10		U		U	U
3-Nitroaniline		u	U		U	U		U	U		U	u
Dibenzofuran	4	U	U	 	U	U	 	U	U	 	U	Ū
4-Nitroaniline	11	u	U		U	U	10		U	<u> </u>	U	u
Carbazole	4	υ	U		Ų	U	+	U	U		U	U

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Draft [" /13/9

Client Sample ID:	RINSE BLANK B		(SD-2) 5	D-02	<u> </u>	. <u>2</u> DUP کر	\$ D-01	2 Duf	SD-01	T	T	SD-10	7-0	
Lab Sample ID:	42563-14			42574-1		,	42574-2			42574-3			42574-4		
Sample Date:	06/23/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV
Units	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual	ug/L	Qual.	Qual.
Analyte							FIELD D	10						†	
SemiVOCs-8270														†	
bis(2-Chloroethyl)ether	4	U	Ų	5	U	U		i U	U		U	U		4 U	Ü
Phenol	4	C	U	5	U	U	t	i U	U	+	5 U	U	 	4 U	u
2-Chlorophenol	4	U	U	5	U	V		5 U	U		5 U	U		4 U	Ū
1,3-Dichlorobenzene	4	U	Ų	5	U	U		5 U	U		υ	U		4 U	U
1,4-Dichlorobenzene	4	Ų	U	5	U	U		i U	U		ίU	Ų		4 U	u
1,2-Dichlorobenzene	4	U	U	5	U	U		5 U	U		5 U	U		4 U	U
bis(2-chloroisopropyl)ether	4	U	U	5	U	u		5 U	U		s U	U	 	4 U	U
Hexachloroethane	4	Ü	U	5	U	U		i U	U		5 U	u		4 0	U
N-Nitroso-di-n-propylamine	4	U	U	5	U	U		5 U	U		U	U	1	4 U	u
Nitrobenzene	4	U	U	5	U	U		i u	U		5 U	U		4 U	u
Isophorone	4	c	U	5	U	U		i u	lu		5 U	lu -		4 U	lu
2-Nitrophenol	4	U	u		U	U		5 U	lυ	 	5 U	U	 	4 U	U
2,4-Dimethylphenol	4	Ü	U	5	U	lu		υ	U	+	S U	U		4 U	บ
bis(2-Chloroethoxy)methane	4	U	U	 	U	lu	 	s U	U	· · · · · · · · · · · · · · · · · · ·	s U	U		4 U	lu
2,4-Dichlorophenol	4	U	u	 -	U	U		5 U	l u		slu	U		4 U	u
1,2,4-Trichlorobenzene		U	U		U	u		5 U	Ü		s U	u	 	4 U	u
Naphthalene	4	IJ	U		U	lu		s u	Ū	·	5 U	Ü	 	4 U	lu -
Hexachlorobutadiene	4	U	w	5	U	u,		5 U	UJ		U	w		4 U	w
4-Chloro-3-methylphenol	4	C	U	5	U	u	1	i U	U		5 U	Ū		4 U	U
Hexachlorocyclopentadiene	11	IJ	Ü	13	U	lu	13	3 U	u		3 U	U	}	0 0	u
2,4,6-Trichlorophenol	4	U	U	5	U	u] [5 U	U		5 U	U		4 U	u -
2-Chloronaphthalene	4	C	U	5	U	U		i U	U		S U	U	+	4 U	lu -
Acenaphthylene	4	0	U	5	U	ļu		s u	U		5 U	U	 	4 U	u
Dimethylphthalate	4	U	U	5	u	U	· · · · · · · · · · · · · · · · · · ·	i U	Ū		5 U	lu -		4 U	lu -
2,6-Dinitrotoluene	4	U	Ų		u	U	 	iU	U		5 U	U		4 U	lu
Acenaphthene	4	J	U		u	lu		3 U	U		5 U	U		4 U	u
2,4-Dinitrophenol	11		u)	13		UJ		3 U	<u>u</u>		3 U	UJ	4	0 0	n)
2,4-Dinitrotoluene	4		Ü		u	u		S U	U		5 U	U	 	4 U	U
4-Nitrophenol	11		Ū			lu	t	3 0	U	4	3 U	U	• 	00	U
Fluorene		U	Ū	<u></u>	U	u		5 U	u		5 U	U -		4 U	Ü
4-Chlorophenyl-phenylether		U	Ü		U	U		5 U	U	· · · · · · · · · · · · · · · · · · ·	5 U	U		4 U	u
Diethylphthalate		U	u		U	lu -		ט	U U		5 U	U		4 U	li -
4,6-Dinitro-2-methylphenol	11		w	 	U	u		3 U	w	· · · · · · · · · · · · · · · · · · ·	3 U	w		0 0	UJ
n-Nitrosodiphenylamine		U	U		U	U		, U	U		5 U	U		4 U	lu Iu
4-Bromophenyl-phenylether		U	u		U	u		ט	u		5 U	U		4 U	U

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Client Sample ID:		-		SD-2) 5	0-02		SD-2DUP)	\$0-0	DUP	SD-01	1	1	SD-10		
Lab Sample ID:				42574-1			42574-2			42574-3		 	42574-4		
Sample Date:	**	Lab	DV	08/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV
Units	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual
Analyte							FIELD)	ρυρ				_			
SemiVOCs-8270				1				1							
Hexachlorobenzene	4	U	Ų		5 U	U	5	U	U		U	U		U	lu -
Pentachiorophenol	11	U	U		3 U	U		U	u	13		U	10	+	0
Phenanthrene		IJ	u	+	5 U	U		Ü	U		U	Ū	 	U	lu l
Anthracene	4	U	U		5 U	υ		Ü	lu		U	U		U	U
Di-n-butylphthalate	2	J	J		5 U	U	 	Ü	u	† 	U	Ū	 	U	lü-
Fluoranthene		Ü	U		5 U	U		i U	U		U	U		U	U -
Pyrene	4	J	U	 	5 U	U		Ü	U		U	U	 	U	lυ—
Butylbenzylphthalate	4	Ü	Ü		5 U	U	 	i U	lu		U	U		U	lu -
3,3'-Dichlorobenzidine		U	U	}	5 U	υ	ŧ	Ü	U -		U	u	 	U	lu
Benzo(a)anthracene	4	u	U		5 U	lu -	ŧ-~	Ū	lu		U	Ü		U	10-
Chrysene	4	U	lu		5 U	u		U	u		U	<u> </u>		U	lii -
ois(2-Ethylhexyl)phthalate	4	U	U		5 U	U		5 U	U		U	U		U	U
Di-n-octylphthalate	4	U	v		5 U	U		i U	lu		U	u	 	U	lu -
Benzo[b]fluoranthene	4	U	U	+	5 U	U	<u> </u>	i U	u		U	Ū	 	U	lu
Benzo(k)fluoranthene	4	U	U		5 U	U	 	iU	lu		U	 	+	U	lu -
Вепzо(а)ругеле	4	υ	U		5 U	U	 	U	lu		U	Ū		U	lu
ndeno(1,2,3-cd]pyrene	4	U	U		5 U	U		U	u	 	U	-		U	lu
Dibenz[a,h]anthracene	4	U	U		5 U	U		υ	lυ		U	U		U	u
Benzo[g,h,i]perylene	4	U	U	+	5 U	U		U	υ		u	lu -		U	Ιΰ
2-Methylphenol	4	Ų	U	1	5 U	U		U	Ū		U	U	 	U	Ū
-Methylphenol	4	U	ū	,	5 U	u	5	U	Ū		U	Ū		U	l u
4-Chloroanlline	4	U	u		5 U	U	5	Ü	v	·	U	U	}	U	U
2-Methylnaphthalene	4	U	U		5 U	U		Ü	υ		U	U		U	<u>υ</u>
2,4,5-Trichlorophenol	11	U	υ	1:	3 U	U		U	Ü	13	 	U	10	1	lu -
-Nitroaniline	11	U	U	4	3 U	U		U	Ū	13		Ū	10	+	lu
3-Nitroaniline	4	U	U	1	5 U	U	 	Ü	Ū		U	U	·	U	lυ
Dibenzofuran	4	J	U	 	5 U	U		U	Ū		U	U	 	U	10-
l-Nitroaniline	11		u	 	3 U	u		U	Ū	13		U	10	 	u
Carbazole		Ų	Ü		5 U	Ū		U	Ü		U	lu-		U	lu –

Client Sample ID:	SD-11		7	SD-8) 5	0-08	\	(s.)	5D-0	9
Lab Semple ID:	42574-5			42575-1			42575-2		
Sample Date:	08/21/99	Lab	DV	06/22/99	Lab	DV	06/22/99	Lab	DV
Units	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.
Analyte			<u> </u>		1		· · · · · ·	+	
SemiVOCs-8270				†				1	
bis(2-Chloroethyl)ether	5	U	U		ı U	U		4 U	U
Phenol	5	 	Ū		ıU	lu	1	4 U	Ū
2-Chlorophenol	5		tū —		ıU	U		4 U	lυ
1,3-Dichlorobenzene	5	 	Ū		U	Ū		4 U	Ū
1,4-Dichlorobenzene	5		u	<u> </u>	ı U	U		4 U	U
1,2-Dichlorobenzene	5	 	U		U	U	 	4 U	υ
bis(2-chloroisopropyl)ether	 	U	Ū	<u> </u>	ıU	Ū.		4 U	lυ
Hexachloroethane	5	+	U	t	, U	Ü	-	4 U	Ü
N-Nitroso-di-n-propylamine	5	 	Ū	<u> </u>	(U	l <u>u</u>		4 U	U
Nitrobenzene	5	-	u	 	l U	U	<u> </u>	4 U	t u
Isophorone	5	+	Ū		ŧ U	Ü	 	4 U	Ų
2-Nitrophenol	5	U	U	 	ıU	U		4 U	lū —
2,4-Dimethylphenol	5	U	u	<u> </u>	۱ U	U	<u> </u>	4 U	lu
bis(2-Chloroethoxy)methane	5	U	u	 	U	U		4 U	Ū
2,4-Dichlorophenol	5		u	1	ıU	U		4 U	Ū
1,2,4-Trichlorobenzene	5	·	lu	<u> </u>	l U	U	 	4 U	U
Naphthalene	5	+	u	<u> </u>	Į U	Ū		4 U	lu -
Hexachlorobutadiene	5		บ่า	 	ı U	w	 	4 U	w
4-Chloro-3-methylphenol	5	U	lu		ı U	U	 	4 U	U
Hexachlorocyclopentadiene	13	U	Ū	· · · · · · · · · · · · · · · · · · ·	ı	U	1	10	Ū
2,4,6-Trichlorophenol	5	U	u	 	١ U	lυ		4 U	Ū
2-Chloronaphthalene	5	+	U		↓ U	U		4 U	lυ
Acenaphthylene	5	U	u		U	Ų		4 U	U
Dimethylphthalate	5	U	υ		ŧ U	U	<u> </u>	4 U	lu
2,6-Dinitrotoluene	5	U	U		ŧ U	U		4 U	U
Acenaphthene	5	υ	U		4 U	U		4 U	U
2,4-Dinitrophenol	13	U	UJ	1	ΙU	W	1	1 U	W
2,4-Dinitrotoluene	5	U	U		∮ U	U	1	4 U	U
4-Nitrophenol	13	Ų	U	1	ıU	Ų	1	1 U	U
Fluorene	5	U	U		ı U	U	 	4 U	U
4-Chlorophenyl-phenylether	 	U	U	}	ıU	U		4 U	Ū
Diethylphthalate		U	U		U	u	1	4 U	U
4,6-Dinitro-2-methylphenol	13		w		U	UJ	 	1 U	w
n-Nitrosodiphenylamine		U	υ		I U	U	 	4 U	U
4-Bromophenyl-phenylether		U	U		U	l u	 	4 U	U

Draft DV 1

Client Sample ID: Lab Sample ID: Sample Date. Units Punalyte SemiVOCs-8270 Hexachlorobenzene Pentachlorobenzene Pentachlorophenol Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate Di-n-octylphthalate	42574-5		 		>-08	اا	SD-9	-		
Unita Analyte SemiVOCs-8270 Hexachlorobenzene Pentachlorophenol Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate	00.004.000	r	1	42575-1	1	ĺ	42575-2	\neg	5-09	
Analyte SerniVOCs-8270 Hexachlorobenzene Pentachlorophenol Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo[a]anthracene Chrysene bis(2-Ethylhexyl)phthalate	100/27/99	Lab	DV	06/22/99	Lab	DV	06/22/99	$\dashv_{\mathbf{i}}$	Lab	DV
SemiVOCs-8270 rlexachlorobenzene Pentachlorophenol Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L		Qual.	Qual.
Hexachlorobenzene Pentachlorophenol Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate								\dashv		
Pentachlorophenol Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate								+		
Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo[a]anthracene Chrysene bis(2-Ethylhexyl)phthalate	5	U	U	4	U	U		4		υ
Anthracene Di-n-butylphthalate Fluoranthene Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate	13		U	11		u	 	-+	<u> </u>	v
Di-n-butylphthalate Fluoranthene Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate	·	U	U	4	U	U	 	-+	U	U
Fluoranthene Pyrene Butylberizylphthalate 3,3'-Dichloroberizidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate	5	U	U	4	U	U	 		ບ	U
Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate	5	U	U	4	U	U	<u> </u>	\rightarrow	U	u
Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate	5	U	υ	4	U	u	<u> </u>		U	u
3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene bis(2-Ethylhexyl)phthalate	5	U	U	 	u	U		-	 U	U
Benzo(a)anthracene Chrysene pis(2-Ethylhexyl)phthalate	5	U	U	4	Ū	U	-	-+	<u>×</u>	U
Chrysene bis(2-Ethylhexyl)phthalate	5	U	υ	4	U	U	†	- 1	I U	U
bis(2-Ethylhexyl)phthalate	5	U	U	4	U	Ų		-+	ັ <u> </u>	U
	5	U	U	4	U	U			<u></u> U	U
Di-n-octylphthalate	5	U	U	4	U	U		4	 U	Ū
• •	5	U	U	4	U	U	T	4	 U	Ū
Benzo[b]fluoranthene	5	U	U	 	U	U			U	U
Benzo[k]fluoranthene	5	U	υ	4	U	U	T	4		U
Benzo(a)pyrene	5	Ų	U	4	U	U	 	4		U
ndeno[1,2,3-cd]pyrene	5	U	U	4	U	U		4		υ
Olbenz[a,h]anthracene	5	U	U	4	U	Ų		4		U
Benzo(g,h,i]perylene	5	U	U	4	U	U	1		U	U
2-Methylphenal	5	U	u	4	U	U		41	U	u
I-Methylphenol	5	U	u	4	U	υ	ļ	4	U	U
l-Chloroaniline	5	U	U	4	U	U	<u> </u>	4	Ų	U
2-Methylnaphthalene	5	U	U	4	U	υ	<u> </u>		Ų	U
2,4,5-Trichlorophenol	13	υ	U	11	U	U		11 (U	U
2-Nitroaniline	13	U	U	11		U		11 (U
3-Nitroaniline	5		U	4	U	U		→	U	U
Dibenzofuran	5		U	4	U	υ	 	4		U
l-Nitroaniline	13	U	u	11		U		11		U
Carbazole				1 11	. •	10	,	1111		17

Draft DV 10/13/99

NEH, Inc. 10 of

I NOR at # 10/13/99 V De @ NEH, Inc. 10/27/92Surfa. Water Results

Draft_v

10/13/99

Client Sample ID	SDOUL GO	- 04	1	RINSE BLAN	<u> </u>		(SD12) 50		T · · · · · ·	SD-13	T		00.00		10
Lab Sample ID:		77	-	42547-2	<u> </u>	├──	42647-3	-12	 	SU-13 42547-4	 	ļ	SD-03		<u> </u>
Sample Date:		Lab	DV	06/17/99	Lab	DV	06/17/99	1	DV			-	42551-1		<u> </u>
	h0/r	Quai.	Qual.	µg/L	Quel.	Qual.	µg/L	Lab Qual	 	06/17/99 µg/L	Lab Qual	DV Qual.	06/18/99	Lab Qual.	DV Qual.
Analyte	1-4-		744.	l Par	acc.	Gud.	PAC	Qua.	Carrier.	PAR	Gues.	Gua.	ha/r	Quai.	Quan.
PCBs/Pesticides-8081A/8082												<u> </u>			
Arodor 1016	0.051	U	U	0.047	U	U	0.042	V	U	0.044	U	U	0.048	U	U
Arodor 1221	0.051	U	U	0.047	U	U	0.042	υ	U	0.044		υ	0.048		U
Aroclor 1232	0.051	U	U	0.047	U	U	0.042	U	U	0.044		v	0.048		U
Arodor 1242	0.051	U	U	0.047	Ü	U	0.042		U	0.044		U	0.048	<u> </u>	U
Aroclor 1248	0.051	Ų	U	0.047	U	U	0.042	υ	U	0.044	U	U	0.048	—	Ū
Aroclor 1254	0.051	Ų	U	0.047	U	u	0.042	U	U	0.044	υ	U	0.048	-	U
Aroclor 1260	0.051	٦	U	0.047	U	U	0.042	U	U	0.044	U	U	0,048		U
Alpha-BHC	0.010	U	U	0.0094	U	Ų	0.0083	U	U	0.0089	U	U	0.0095	υ	UJ
Gamma-BHC	0.010	U	Ų	0.0094	U	U	0.0083	U	U	0.0089	U	u	0.0095	U	W
Beta-BHC	0.010	U	U	0.0094	Ü	u	0.0083	U	U	0.0069	U	U	0.0095	U	U
Delta-BHC	0.010	כ	υ	0.0094	U	U	0,0083	U	U	0.0089	U	U	0.0095	U	U
Heptachlor	0.010	U	U	0.0094	U	Įυ	0.0083	u	u	0.0089	U	υ	0.0095	U	บง -
Aldrin	0.010	U	U	0.0094	U	U	0.0083	U	υ	0.0089	U	V	0.0095	U	U
Heptachlor Epoxide	0.010	-	U	0.0094	U	U	0.0083	U	U	0.0089	U	Ų	0.0095	υ	U
Gamma Chlordane	0.010	U	V	0.0094	υ	U	0.0083	U	U	0.0089	U	U	0.0095	U	U
Alpha Chlordane	0.010	<u>د</u>	Ų	0.0094	U	U	0.0083	U	U	0.0089	U	v	0.0095		Ų
Endosulfan I	0.010	C	υ	0.0094	U	U	0.0083	U	U	0.0089	U	U	0.0095	U	U
4, 4'-DDE	0.010	U	Ų	0.0094	U	U	0.0083	U	U	0.0089		U	0.0095	U	u
Dieldrin	0.010	U	U	0.0094	U	U	0.0083	Ų	U	0.0089	U	Ü	0.0095		lu
Endrin	0.010	V	U	0.0094	Ų	U	0.0083	U	υ	0.0089	 -	lu	0.0095		Ū
4, 4'-DDD	0.010	U	U	0.0094	U	υ	0,0083	U	U	0.0089		Ū	0.0095		u
Endosulfan II	0.010	U	U	0.0094	U	U	0.0083	+	Ū	0.0089		lu -	0.0095		u
4, 4'-DDT	0.010	U	U	0.0094	U	U	0.0083	+	Ü	0.0089		u	0.0095	 	U
Endrin Aldehyde	0.010	U	U	0.0094	U	U	0.0083		v	0.0089	} -	υ	0.0095		w
Endosulfan Sulfate	0.010	U	U	0.0094		U	0.0083		Ų	0.0089		Ū	0.0096	· · · · · · · · · · · · · · · · · · ·	U
Methoxychior	0.051	U	U	0.047	U	U	0.042	U	υ	0.044	+	u	0.048		UJ
Endrin Ketone	0.010	Ų	U	0.0094		U	0.0083	 	U	0.0089		Ū	0.0095		UJ
Toxaphene	0.10	U	U	0.094	U	U	0.083	+	tu –	0.089	 	lu	0.095		

Client Sample ID:				RINSE BLAN	(SD-06			SD-07DEEP		1	SD-07SHALL	WC	7
Lab Sample ID:				42551-3]	42551-5			42551-6	_		42551-7		1
Sample Date:		Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV	06/18/99	Lab	DV
Units	μg/L	Qual.	Qual.	μ g/L	Qual.	Qual.	µg/L	Qual.	Qual.	µg/L	Qual.	Qual.		Qual.	Qual
Analyte					-					<u> </u>					1
PCBs/Pesticides-8081A/8082		{									-		<u> </u>		1-
Aroclor 1016	0.042	υ	U	0.048	U	Ų	0.041	U	U	0.042	u	U	0.042	11	[]
Aroclor 1221	0.042	U	U	0.048	U	U	0.041	 	Ü	0.042		lu	0.042		U
Aroclor 1232	0.042	U	U	0.048	U	U	0.041	U	υ	0.042		lu	0.042		U
Araclar 1242	0.042	U	U	0.048	U	u	0.041	υ	บ	0.042	<u> </u>	U	0.042		lu
Aroclor 1248	0.042	U	U	0.048	U	ļu -	0.041	+	υ	0.042		U	0.042		lu
Aroclor 1254	0.042	U	υ	0.048	U	U	0.041	+	Ų	0.042		Ū	0.042	 -	╁┈
Aroclor 1260	0.042	U	U	0.048	υ	U	0.041		U	0.042		Ü	0.042		υ U
				1		 		ļ —	1	1	-	<u> </u>		-	┿
Alpha-BHC	0.0084	U	w	0.0095	U	w	0.0082	U	w	0.0083	U	w	0.0083	U	UJ
Gamma-BHC	0.0084	U	UJ	0.0095	U	w	0.0082	U	UJ	0.0083	, 	w	0.0083		UJ
Beta-BHC	0.0084	U	U	0.0095	U	U	0.0082	U	U	0.0083	U	u	0.0083		lu
Detta-BHC	0.0084	U	U	0.0095	U	U	0.0082	U	U	0.0083	U	U	0.0083		U
Heptachlor	0.0084	U	U	0.0095	U	Ų	0.0082	U	U	0.0083	U	U	0.0083		U
Aldrin	0.0084	U	υ	0.0095	υ	Ų	0.0082	U	υ	0.0083	U	U	0.0083	U	U
Heptachlor Epoxide	0.0084	Ų	U	0.0095	U	u	0.0082	U	U	0.0083	U	U	0.0083	U	U
Gamma Chlordane	0.0084	υ	Ų	0.0095	U	U	0.0082	U	U	0.0083	Ų	U	0.0083	U	U
Alpha Chlordane	0.0084	υ	U	0.0095	U	U	0,0082	U	U	0.0083	U	u	0.0083	U	U
Endosulfan I	0.0084	U	u	0.0095	U	U	0.0082	U	u	0.0083	U	U	0.0083	U	U
4, 4'-DDE	0.0084	U	ļu	0.0095	U	Ü	0.0082	U	ย	0.0083	U	U	0.0083	IJ	U
Dieldrin	0.0084	U	U	0.0095	U	U	0.0082	U	U	0.0063	U	U	0.0083	IJ	U
Endrin	0.0084	Ų	Ų	0.0095	U	U	0.0082	U	U	0.0083	U	U	0.0083	U	lu
4, 4'-DDD	0.0084	U	u	0.0095	U	U	0.0082	U	U	0.0083	U	u	0.0083	U	lu
Endosulfan II	0.0084	υ	U	0.0095	U	υ	0.0082	U	Ü	0.0083		u	0.0083	<u> </u>	U
4, 4'-DDT	0.0084	U	U	0.0095	U	U	0.0082	 	u	0.0083		u	0.0083		U
Endrin Aldehyde	0.0084	Ú	w	0.0095	U	w	0.0082	 	w	0.0083		<u>u</u>	0.0083		<u> </u>
Endosulfan Suffate	0.0084	Ú	U	0.0095	U	U	0.0082	U	U	0.0083		U	0.0083		U
Methoxychlor	0.042	Ų	w	0.048	U	UJ	0.041	U	W	0.042		UJ	0.042		W
Endrin Ketone	0.0084	U	W	0.0095	U	W	0.0082	u	IJ	0.0083		w	0.0083		UJ
Toxaphene	0.084	U	U	0.095	U	U	0.082	u	u	0.083	-	U	0.083		U

Client Sample ID:	SD-05DEEP	_	T	SD-05SHALL	OW		RINSE BLANI	K		RINSE BLAN	K		RINSE BLAN	K	Γ
Lab Sample ID:	42551-8			42551-9			42562-3			42563-9	<u> </u>	_	42563-14	<u> </u>	
Sample Date:	06/18/99	Lab	DV	06/18/99	Lab	DV	06/21/99	Lab	VQ	06/22/99	Lab	DV	06/23/99	Lab	DV
Units	μΦ/Γ	Qual.	Qual.	µg/L	Qual.	Qual.	μg/L	Qual.	Qual.	μ g/ L	Qual.	Qual.	µg/L	Qual.	Qual.
Analyte															<u> </u>
PCBs/Pesticides-8081A/8082															
Aroclor 1016	0.044	U	U	0.044	U	U	0.040	U	U	0.040	U	U	0.043	U	u
Aroclor 1221	0.044	U	U	0.044	U	U	0.040	U	u	0.040	U	U	0.043	U	u
Aroclor 1232	0.044	U	U	0.044	U	U	0.040	U	U	0.040	U	U	0.043	U	U
Aroclor 1242	0.044	Ų	U	0.044	U	U	0.040	U	Ų	0.040	U	U	0.043	U	v
Aroclor 1248	0.044	U	U	0.044	u	υ	0.040	U	U	0.040	U	υ	0.043	υ	U
Aroclor 1254	0.044	U	U	0.044	U	U	0.040	U	u	0.040	U	U	0.043		U
Arodor 1260	0.044	U	U	0.044	U	U	0.040	U	U	0.040	U	Ų	0.043	U	U
													- · · · · · · · · · · · · · · · · · ·		
Alpha-BHC	0.0089	U	Ų	0.0088	U	υJ	0.0080	U	U	0.0081	U	Ų	0.0087	U	U
Gamma-BHC	0.0089	U	W	0.0088	U	w	0.0080	U	U	0.0081	U	U	0.0087	U	U
Beta-BHC	0.0089	υ	υ	8800.0	U	Ų	0.0080	U	U	0.0081	U	U	0.0087	 -	U
Delta-BHC	0.0089	U	U	0.0088	Ų	U	0.0080	U	U	0.0061	U	U	0.0087	U	U
Heptachlor	0.0089	U	U	0.0088	υ	υ	0.0080	Ų	U	0.0081	U	v	0.0087	U	U
Aldrin	0.0089	U	Ų	0.0088	U	U	0.0080	U	U	0.0081	U	Ų	0.0087	U	U
Heptachlor Epoxide	0.0089	U	U	0.0086	U	U	0.0080	U	U	0.0081	U	U	0.0087	υ	U
Gamma Chlordane	0.0089	U	U	0.0088	U	U	0.0080	U	U	0.0081	U	U	0.0087	U	U
Alpha Chlordane	0.0089	U	U	0.0088	U	U_	0.0080	U	U	0.0081	Ų	Ų	0.0067	U	U
Endosulfan I	0.0089	U	u	0.0088	U	U	0.0080	J	U	0.0081	U	U	0.0087	U	u
4, 4'-DDE	0.0089	U	U	0.0088	U	U	0.0080	U	U	0.0081	U	Ų	0.0087	U	Ų
Dieldrin	0.0089	U	u	0.0088	U	U	0.0080	د	Ų	0.0081	U	U	0.0087	U	u
Endrin	0.0089	U	U	0.0088	U	U	0.0080	Ų	U	0.0081	U	U	0.0087	Ų	U
4, 4'-DDD	0.0089	U	U	0.0088	υ	U	0.0080	Ų	Ų	0.0081	U	u	0.0087	U	u
Endosulfan II	0.0089	U	U	0.0088	U	U	0.0080	U	U	0.0081	U	U	0.0087	U	U
4, 4'-DDT	0.0089		U	0.0088	U	U	0.0080	U	m	0.0081	U	UJ	0.0087	U	ŲĴ
Endrin Aldehyde	0.0089	U	UJ	0.0088	U	IJ	0.0080	Ų	W	0.0081	U	UJ	0.0087	Ų	Ųΰ
Endosulfan Sulfate	0.0089	U	U	0.0088	U	U	0.0080	U	u	0.0081	U	U	0.0087	U	U
Methoxychior	0.044		UJ	0.044	U	υJ	0.040	U	uJ	0.040	U	w	0.043	U	UJ
Endrin Ketone	0.0089	U	UJ	0.0088	U	ŲJ	0800.0	U	UJ	0.0081	U	Ų	0.0087	U	UJ
Toxaphene	0.089	U	U	0.088	U	U	0.080	U	U	0.081	U	U	0.087	U	u

Draft DV 10/13/99

Client Sample ID:	SD-2) 50-	02	7	SD-2 DUP	6D-0	ZWP	SD-01		,	SD-10		Τ	SD-11		
Lab Sample ID:			`	42574-2			42574-3			42574-4		 	42574-5		
Sample Date:	06/21/99	Lab	DV	06/21/99	Lab	Va	06/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV
Units	µg/L	Qual.	Qual.	μg/L	Qual.	!	µg/L	Qual.	Qual.	µg/L	Qual.	Qual.			Qual.
Analyte				FIELD DI	مر										1
PCBs/Pesticides-8081A/8082															
Aroclor 1016	0.048	υ	U	0.046	U	U	0.045	บ	Ų	0.041	U	U	0.043	u	U
Arodor 1221	0.048	υ	U	0.045	U	U	0.045	u	U	0.041	}	u	0.043		Ū
Araclor 1232	0.048	U	Ü	0.046	υ	U	0.045	U	U	0.041	U	U	0.043		U
Arodor 1242	0.048	υ	U	0.046	U	υ	0.045	U	U	0.041		υ	0.043		lu -
Araclar 1248	0.048	U	U	0.046	U	U	0.045	U	U	0.041	Ú	u	0.043		U
Arocior 1254	0.048	U	Ų	0.046	U	U	0.045	Ų	U	0.041	U	u	0.043	U	U
Aroclor 1260	0.048	U	u	0.046	U	U	0.045	U	U	0.041	U	U	0.043	U	U
Alpha-BHC	0.0095		U	0.0092		u	0.0091	-	U	0.0082	11	u -	0.0086		lu-
Gamma-BHC	0.0095		U	0.0092		ŭ	0.0091		 	0.0082		lu	0.0086		<u>lu</u>
Beta-BHC	0.0095	+	u -	0.0092		Ū	0.0091	 	<u> </u>	0.0082		u	0.0086		lu -
Delta-BHC	0.0095	 	u	0.0092		Ū	0.0091		υ ·	0.0082	/	u	0.0086	 	u
Heptachlor	0.0095	- -	U	0.0092		Ū	0.0091	 	u	0.0082	-	<u> </u>	0.0086		Tu -
Aldrin	0.0095	 	Ü	0.0092	 	U	0.0091		u	0.0082		lu -	0.0086		lu
Heptachlor Epoxide	0.0095	U	U	0.0092		U	0.0091		U	0.0082		lu	0.0086		u .
Gamma Chlordane	0.0095	U	U	0.0092	U	U	0.0091		U	0.0082		lu	0.0086		U
Alpha Chlordane	0.0095	U	U	0.0092	U	U	0.0001	 	U	0.0082		U	0.0086	 	U
Endosultan I	0.0095	Ų	υ	0.0092	U	υ	0.0091	U	U	0.0082	U	U	0.0086	U	U
4, 4'-DDE	0.0095	U	υ	0.0092	Ų	Ų	0.0091	U	U	0,0082	U	U	0.0086	U	U
Dieldrin	0.0095	υ	Ü	0.0092	U	U	0.0091	U	u	0.0082	U	U	0.0086	U	U
Endrin	0.0095	Ų	u	0.0092	U	υ	0.0091	Ų	U	0.0082	U	u	0.0086	U	U
4, 4'-DDD	0.0095	U	٥	0.0092	U	U	0.0091	U	U	0.0082	U	U	0,0086	U	υ
Endosulfan II	0.0095	U	υ	0.0092	υ	υ	0.0091	U	U	0.0082	Ų	U	0.0086	U	U
4, 4'-ODT	0.0095	U	เกา	0.0092	U	υJ	0.0091	U	UJ	0.0082	U	w	0.0086	U	W
Endrin Aldehyde	0.0095	U	กา	0.0092	U	IJ	0.0091	U	W	0.0082	U	w	0.0086	U	U
Endosulfan Sulfate	0.0095	U	U	0,0092	U	IJ	0.0091	U	U	0.0082	U	u	0.0086	Ų	Ų
Methoxychlor	0.048	U	บม	0.046	U	IJ	0.045	Ü	W	0.041	U	w	0.043	U	W
Endrin Ketone	0.0095	U	υJ	0.0092	U	IJ	0.0091	U	W	0.0082	U	UJ	0.0086	U	เกา
Toxaphene	0.095	U	U	0.092	υ	U	0.091	U	U	0.082	U	u	0.086	U	U

Draft DV 10/13/29

Cilent Sample ID	SD-8) 5b	0B	(SD-9) 5	5- 0°	1
Lab Sample ID:	42575-1			42575-2		
Sample Date	06/22/99	Lab	DV	06/22/99	Lab	DV
Units		Qual.	Qual,		Qual.	Qual.
Analyte						
PCBs/Pesticides-8081A/8082						
Aroclor 1016	0.053	U	υ	0.051	U	U
Aractor 1221	0.053	U	U	0.051	Ų	U
Arodor 1232	0.053	U	U	0.051	U	U
Aroclor 1242	0.053	U	U	0.051	Ų	U
Aroclor 1248	0.053	U	U	0.051	Ų	U
Aroclor 1254	0.053	U	U	0.051	Ų	U
Araclar 1260	0.053	U	U	0.051	U	U
Alpha-BHC	0.010	U	U	0.010	U	U
Gamma-BHC	0.010	U	U	0.010	U	U
Beta-BHC	0.010	U	U	0.010	U	U
Delta-BHC	0.010	u	u	0.010	U	U
Heptachlor	0.010	U	U	0.010	U	U
Aldrin	0.010	U	u	0.010	U	U
Heptachlor Epoxide	0.010	บ	U	0.010	U	U
Gamma Chlordane	0.010	U	u	0.010	u	U
Alpha Chlordane	0.010	U	U	0.010	U	U
Endosulfan I	0.010	U	U	0.010	U	U
4, 4'-DDE	0.010	U	<u>u</u>	0.010	U	Ų
Dieldrin	0.010	U	U	0.010	Ų	U
Endrin	0.010	U	U	0.010	U	U
4, 4'-DDD	0.010	U	U	0.010	U	U
Endosulfan II	0.010	U	u	0.010	U	U
4, 4'-DDT	0.010	u	UJ	0.010	U	υJ
Endrin Aldehyde	0.010	u	U	0.010	U	U
Endosulfan Sulfate	0.010	U	u	0.010	U	U
Methoxychlor	0.053	U	UJ	0.051	U	uj
Endrin Ketone	0.010	U	เกา	0.010	U	UJ
Toxaphene	0.10	U	U	0.10	Ų	C

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Data Usability Review

Metals Analyses

by EPA Methods 6010B (ICP), 7471A (CVAA), and 7000 series (GFAA) EPA Region I Tier III - type review

Client:

Menzie-Cura & Associates, Inc.

Site:

Industri-Plex, Woburn, Massachusetts

Laboratory:

Woods Hole Group Environmental Laboratory, Raynham, MA

SDG:

Lab ETR #s: 42537, 42541, 42562 and 42563

of samples/Analyses:

14 sediment samples and 5 rinsate blanks for project-specific list of 19 metals

Initial Reviewer: Susan D. Chapnick, New Environmental Horizons, Inc. Swilliam Chapnick

Senior Reviewer: Dr. Nancy Rothman, New Environmental Horizons, Inc.

Date Completed: December 09, 1999

The Data Usability Review, representing a Region I Tier III-type validation, was performed on the data package. The intentions of this review are:

- 1. To determine if the data were generated and reported in accordance with the following:
 - EPA SW-846 Methods 6010B for ICP, 7471A for CVAA, and 7000 series for GFAA;
 - Toxicological Surface Water and Sediment Sampling and Fish Sampling Work Plan and Quality Assurance Project Plan for Industri-Plex Site, Woburn, Massachusetts, July 1999;
 - Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, 12/96;
 - Region I Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses, February 1989.
- 2. To determine if the data met the program data quality objectives for acceptable accuracy, precision, and sensitivity.
- 3. To determine and define the technical usability of the data based on the accuracy, precision, and sensitivity QA/QC indicators defined in the site QAPP.
- 4. To update the project database with appropriate data quality qualifiers.

The Data Usability Review consists of five sections. Section I is the Overall Summary of Data Usability including subsections addressing technical usability, accuracy, precision, representativeness, and sensitivity of the data. Sections II through V are hand-completed checklists: Section II - Data Package Completeness Review; Section III - Review of the Laboratory Data Summary Forms and Additional QA/QC Parameters; Section IV - Review of Overall Data Package Compliance; and Section V - Example Sample Calculations.

I. Overall Summary of Data Usability

A. Summary of Technical Usability

All sediment and rinsate blank results for metals included in the laboratory data package reviewed, identified by Woods Hole Group Environmental Laboratory (WHG) as project numbers (ETRs) 42537, 42541, 42562 and 42563 are usable for project objectives. Results have been estimated (J) for several metals in these samples due to quality control criteria exceedances or uncertainty in the results near the laboratory method detection limit (MDL). Data users should note the following uncertainties in the estimated results. The estimated results are usable for project objectives of risk assessment.

B. Technical Issues Affecting Accuracy

Holding times, calibration criteria, laboratory control sample recoveries, matrix spike recoveries, and other method-specific QC sample results were reviewed to evaluate the accuracy of the sediment results.

The accuracy for antimony and selenium in all sediments was compromised based on low matrix spike recoveries of 44.6% and 54.8%, respectively. All antimony and selenium results were estimated (J) and may be biased low.

The LCS used was matrix-matched for all metals except silver. The silver LCS was an aqueous laboratory-fortified blank. The laboratory stated in their case narrative that had been obtaining variable recoveries from the solid LCS for silver that they were using for other metals. Therefore, they performed an aqueous LCS to evaluate method performance during digestion and analysis. No action was taken to qualify the silver results because the matrix spike sediment result was acceptable for silver indicating acceptable accuracy in the sediment matrix.

All other quality control information, such as holding times, LCS recoveries, and calibration QC, associated with accuracy met QAPP and method criteria for the other metals results in these sediment samples.

C. Technical Issues Affecting Precision and Representativeness

The relative percent difference (RPD) between sample and matrix (lab) duplicate results and between field duplicate pair results were evaluated to assess precision and representativeness of the sediment data.

Precision, based upon the relative percent difference (RPD) of the matrix duplicate results, was acceptable for metals in the sediment samples. Note that precision could not be evaluated for thallium in the matrix duplicate results, as these results were non-detected.

C. Technical Issues Affecting Precision and Representativeness - continued

One field duplicate pair was associated with these sediments: SD-05 and SD-05DUP. The field duplicate pair results showed imprecision for four metals based upon high relative percent difference (RPD) between field duplicate results (RPD in parentheses): antimony (56%), barium (60%), selenium (63%), and thallium (54%). These metal results in the field duplicate pair samples were estimated (J) and are imprecise. Poor field duplicate precision is an indication of sample matrix heterogeneity. Sediment heterogeneity may affect the representativeness of the sediment to the site location

D. Technical Issues Affecting Sensitivity

Blank contamination in method blanks, field rinsate blanks, and initial and continuing calibration blanks, along with an evaluation of the laboratory MDLs were reviewed to assess sensitivity of the results compared to QAPP-required reporting limits.

Sensitivity was acceptable for all sediment sample results compared to the project-specific reporting limits defined in Table 1-7 of the site QAPP (July 1999). Though low-level contamination of several metals was observed in the associated laboratory and rinsate blank results, the sediment results were greater than the calculated blank action levels. Therefore, no blank actions were taken. Several results in the rinsate blanks were estimated (J) due to potential uncertainty near the MDLs. No actions were taken to qualify the rinsate blanks based on laboratory method blank results.

The "as received," or native, sediments all had % solids < 30%. The freeze-drying process removed a significant portion of the water content of these samples such that all freeze-dried % solids were > 40%. The increase in solids content of these samples contributed to the acceptable sensitivity of the metals measurements by decreasing the achievable sample-specific reporting levels (on a dryweight basis).

E. Additional Technical and QA/QC Issues

A review of method compliance, an evaluation of method modifications, and other QA/QC issues were made to evaluate the comparability of the data generated for the project uses.

Several detected results for beryllium, silver, and thallium, that were not previously qualified or negated for other QC criteria, were estimated (J) due to uncertainty of the quantitation at levels less than the 5x the MDL and less than the project-required reporting limit.

F. Summary of Completeness, Documentation, and Chain-of-Custody Issues

Chain-of-custody (COC) documentation of temperature on receipt at the laboratory was missing for several COCs. For samples received 6/21/99, a receipt temperature of 7° C was recorded. This exceeds the criterion of 4 ± 2 °C. The samples were collected in the summer and immediately sent via courier to the laboratory. Only surface water samples were collected associated with this COC. It appears that they did not have a chance to cool-down completely by the time they were received at the laboratory. No action was taken other than to note this discrepancy.

Indication of "sediment" or "surface water" for the association of the five-rinsate blanks was not made on the chain-of-custodies. However, personal communication with the sampler, Peter Kane of Woods Hole Group Environmental Laboratory, confirmed that the rinsate blanks were taken as rinses of the Eckman grab samplers used for sediment collection.

Times of sampling were not recorded on the chain-of-custody's for the sampling done on June 21 through June 23, 1999.

The laboratory data package was missing Form 14, Analysis Run Log, for some silver analyses by GFAA. The raw instrument data were included with a hand-completed run log. Therefore, no action was taken other than to note this discrepancy.

NEH generated a data summary table based on the project data file supplied by the laboratory including the corrections and qualifications added to the data based on this Data Usability Review. The data summary table of technically valid and usable results for sediments reviewed by NEH is attached to this report.

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Metals_sec Page 1 of 4

Industri-Plex, Wowurn, MA Metals - Sediment

SUC 12/9/99

Validated 12/09/99 NEH, Inc.

Sample Location (D:	SD-01			SD-02	ļ		SD-03	İ		SD-04		
Lab_ID:	42562-4		·	42562-1			42541-1	· · · · · ·	- †- ·- 	42537-1	 	
Date Sampled:	06/21/1999	Lab	DV	06/21/1999	Lab	DV	06/18/1999	Lab	DV	06/17/1999	Lab	DV
Units:	mg/Kg dry weight	Qual.	Qual.	mg/Kg dry weight	Qual.	Qual.	mg/Kg dry weight	Qual.	Qual.	mg/Kg dry weight	Qual.	Qual.
Freeze-Dried Percent Solids (%)	87.0%		[Bias]	92.3%		[Bias]	77.7%	,	[Bias]	67.0%		[Bias]
Analyte - Metals	Reference Location			Reference Location			Reference Location			Reference Location		
EPA Methods 6010 and 7000 series			l									
Aluminum	4740			8620			15200)		10200	ŀ	1
Antimony	0.81	N	j [low]	1.4	N	J [low]	0.93	N	J [low]	1.2		J [low]
Arsenic	12.2			29.9		- I	21.4	ı		32.7		†
Barium	59			80.7			89.6	3		108	 	1
Beryllium	0.39	В	J	1.1	i		0.95	5		0.71		
Cadmium	0.5			2.9			2.8			6.1	 	
Chromium	12.2	E		155	E		45.2	E		311	E	1
Cobalt	6.4		<u> </u>	12.1			13.2	2		21.0		
Соррег	31.6			65.7	!		7.5	5		290		
iron	11700			25500	L		20300)		36400		1
Lead	188			197			153	3		49.0		
Vlanganese	396			837			383	3		1520		
Viercury	0.31			0.35			0.26	5		0.6		
Nickel	9.2			19.6			24.3	3		25.8	,	1
Selenium	0.94	N	J [low]	1.2	N	J [low]	0.88	N	J [low]	1.5	N	J (low)
Silver	0.085	В	J	0.47			0.9)!	T	0.75		
Thallium	0.36	U	U	0.45	U	U	0.55	U	U	0.62	U	Ū
√anadium	20.0			51.5			43.5	j		50.2		1
Zinc	131			377			457	7	1	590	:	

ample Location ID:	SD-05		!	SD-05DUP	i	-	SD-06			SD-07	1	
ıb_ID:	42563-1			42563-3	+ -	 -	42563-12	 	·	42563-10		- +
ate Sampled	06/22/1999	Lab	DV	06/22/1999	Lab	DV		Lab	Ιον	06/23/1999	Lab	DV
nits:	mg/Kg dry weight	Qual.	Qual.	mg/Kg dry weight	Qual.	Qual.	mg/Kg dry weight		Qual.	1	Qual.	Qual.
eeze-Dried Percent Solids (%)	97.3%	[[Bias]	55.1%		[Bias]	87.7%	+	(Bias)	61.1%	+	[Bias]
nalyte - Metals			-	Field Duplicate				1			 	10.00,
PA Methods 6010 and 7000 s						_		_			 	-
luminum	14000			13400			10400	-		15000	 	
ntimony	8.0	N	J [low]	4.5	N	J [low]	9.6	+	J [low]	3.6		J [low]
rsenic	956			1250	,	- 	273	+	1-3-3-4	2390	+	10 (1011)
arium	104		J	193	,†	J	49.2	†		119	+	
eryllium	1.9		T	1,7			1.0	T		1.4	-t	
admium	25.5			26	,		15	†		20.9	+	
hromium	428	E		417	E		790	E		476	+	
obalt	15.3			13.6			27.5		_ -	19.9	+	
opper	794			785			824			571	 	
on	66400	·		76600			39600	1		116000		1
ead	418			415	3		567			421	+	
langanese	732			706	i		358			891	1	
lercury	1.8	ļ	_ <u> </u>	1.9			2.4			1.4		
ickel	28.1			25.8	l l		27.8			30.4		
elenium	1.5	N	J [low]	2.9	N	J [low]	2.4	N	J [low]	2.5		J [low]
ilver	1.3			1.3			2.0			1.2	+	
hallium	0.69	В	J	1.2	В	J	2.0			0.82	В	J
anadium	83.4			76.3			38.9			75.2	:[
inc	3770			2990			3710			3310	-	

Metals_sed.... Page 3 of 4

Industri-Plex, Wopurn, MA Metals - Sediment

Validated 12/09/99 NEH, Inc.

Sample Location ID:	SD-08	1	!	SD-09			SD-10			SD-11		
_abIO:	42563-7			42563-5		1	42562-6		———	42562-8	†·	
Date Sampled:	06/22/1999	Lab	DV	06/22/1999	Lab	DV	06/21/1999	Lab	DV	06/21/1999	Lab	DV
Jnits:	mg/Kg dry weight	Qual.	Qual.	mg/Kg dry weight	Qual.	Qual.	mg/Kg dry weight	Qual.	Qual.		Qual.	Qual.
reeze-Dried Percent Solids (%)	78.0%		[Bias]	41.7%		[Bias]	78.7%	·	[Bias]	81.3%		[Bias]
\nalyte - Metals												
EPA Methods 6010 and 7000 s		;										_
Muminum	7120	i t		17500			7540			11000	ļ	
Antimony	1.8	N	J [low]	7.3	N	J [low]	2.3	N	J [low]	3.6		J (low)
Arsenic	594			802	i		639			1200	+	1
3arium	75.8		1	96.8	:		73.6			129	 	·
3eryllium	0.93			1.9	! 		0.9			1.1		1
Cadmium	24.9	1		29.7			14.4		-	20.6		<u> </u>
Chromium	244	E		641	E		361	E		477		·
Cobalt	42.4			75.1			43.1			27.3		1
Copper	333			1110			356			527		
ron	110000			111000			94800			138000	†	
.ead	129			397			116			200		1
Manganese	1580	İ		2090	İ.		2300			1280		1
Aercury	0.78	:		3.8			1.8			3.6		
lickel	19.9	· •		44.0			21.1			20.1		
Selenium	2.1	N	J [low]	5.5	N	J [low]	2.5	N	J [low]	3.6	N	J [low]
Silver	0.41			1.1			0.32	В	J	0.69		
hallium	1.0	В	j	2.1			0.42	U	U	0.41	U	U
/anadium	34.4			57.1			30.8			48.0		
:inc	6340	ļ		7420			4040			4900		<u> </u>

mple Location ID:	SD-12			SD-13			
b_ID:	42537-4			42537-6	-	-	
te Sampled:	06/17/1999	Lab	DV	06/17/1999	Lab	DV	
its:	mg/Kg dry weight	Qual.	Qual.	mg/Kg dry weight	Qual.	Qual	
seze-Dried Percent Solids (%)	83.6%		[Bias]	79.1%	 	(Bias]
alyte - Metals	Reference Location						
'A Methods 6010 and 7000 s						Ţ	
munimu	7520			18100			
itimony	0.71	N	J (low)	2.8	N	J [l	ow]
senic	22.8			339	ļ		
ırıum	70.5	<u></u>		71	i	<u> </u>	
ryllium	0.52			1.1		-	
admium	1.2			5.3		1	
romium	198	E		956	E	1	
<u>balt</u>	9.2	В		21.4	 		
<u>pper</u>	36.3	Ĺ		486	· · · · · · · · · · · · · · · · · · ·	1	
)n	17800			55000			
:ad	153			647			
anganese	1180			1150			
ercury	0.42	ļ -	_	3.4			
ckel	10.9			30.6	<u> </u>		
elenium	1.2	N	J [low]	2.1	N	J [I	ow)
Iver	0.2		J	1.0	i		
nallium	0.49	U	u	0.52	U	U	
anadium	23.7			64.6	1		
nc	234			1200			

V De 12/8/99,

Metals_Rin. anks.xls Page 1 of 1

Industri-Plex, Woodurn, MA Metals Rinsate Blanks for Sediment Sampling

Validated 12/08/99 NEH, Inc.

Sample Location ID:	1	Rinse Blank	<u>i</u>	<u>-</u>	Rinse Blank		<u>.</u>	Rinse Blank			Rinse Blank	ļ	:	Rinse Blank		
ab <u> D:</u>		42547-2	<u> </u>		42551-3	<u> </u>		42562-3		1	42563-9		!	42563-14		
Date Sampled:	_ [06/17/1999	Lab	DV	06/18/1999	Lab	DV	06/21/1999	Lab	DV	06/22/1999	Lab	DV	06/23/1999	Lab	DV
Jnits:		ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	ug/L	Qual.	Qual.	·	Qual.	Qual.
Analyte - Metals													1			
EPA Methods 6010 and 700	0 series		i													
Numinum		227			6:	3 B	Ĵ	31.9	В	J	34.5	В	J	818		
Antimony		2	В	J	1.7	7 U	U	1.7	' U	U	1.7	U	U	1.7	В	j
∖rsenic	.].	1.1	υ	υ	1.	1 U	U	1.1	Ū	U	1.4	В	J	1.4	В	J
3arium		3.5	В	J	1.3	7 B	J	1.2	2 U	U	1.2	U	U	1.6	В	J
3eryllium		1.4	В	J		1 B	J	0.62	B	J	0.98	В	J	0.98	В	J
Cadmium		0.21	U	U	0.2	U	U	0.21	U	U	0.21	u	บ	0.21	U	u
Chromium		9.1	В	J	9.	В	J	8.4	В	J	12.9	В	J	11.1	В	J
Cobalt		3.7	U	U	3.7	7 U	U	3.7	' U	Ų	3.7	u	U	3.7	U	U
Copper		8.4	В	J	5.8	В	J	11.3	В		9.4	В	J	11.4	В	
ron		59.6	В	J	28.	5 B	J	50.9	8	J	80.8	В		88.8	В	
.ead	l	64.8	U	U	64.8	U	U	64.8	U	U	64.8	U	U	64.8	u	U
/langanese		7.3	В	J	4.6	3 U	U	4.6	Ü	U	4.6	U	U	4.6	υ	U
/lercury		0.04	U	U	0.04	ŧ U	U	0.04	U	U	0.04	U	U	0.04	U	U
lickel	_	7.9	+	U	7.9	U	U	7.9	U	u	7.9	U	U	7.9	U	U
ielenium		1.3		U	1.3	3 U	U	1.3	s{u	ļu	1.3	Ų	U	1.3	U	U
liver		0.17	U	U	0.17	7 U	U	0.17	7 <u>U</u>	U	0.17	U	U	0.17	U	U
'hatlium		1.9	U	U	1.5	U	U	1.9	U	U	1.9	Ų_	U	1.9	U	υ
'anadium		3.6		U	3.6	3 U	U	3.6	i U	U	3.6	U	υ	3.6	U	U
linc		9.8	В	J	18.4	4 B		38.4	3		25.2	В	T	12.8	В	J

Sediment

12/9/99

Data Usability Checklist Review - Inorganics NEH, The Industri-Plex Site, Woburn, MA

Ecological and Human Health Environmental Investigations 1999

II. Data Package Completeness

Laboratory: Woods Hole Group Env. Lab SDG: 42562, 42541, 42537, 42563

- Review the data package for completeness based on EPA Region I and Site QAPP requirements.
- b. Were all required reporting forms and associated raw data included in the data package?

 Yes No. If no, contact laboratory for resubmittals and attach copy of resubmittal request to this checklist
- c. Were Form 1s (result forms) and raw data for all samples listed in the laboratory case narrative included in the data package? Yes No. Were all sample analyses requested on the Chain-of-Custody performed by the laboratory? Yes No.

Indicate missing information or analytical issues in the section below.

Summarize the number and types of samples in this SDG: + 1 Field Duplicati
13 appropriate - tax 19 mobile / propriat-corrector /15t
sediments were freeze-dried prior to preparation
5 Rinsate blanks, were associated with these.
sediments. 3 of them were included in this, lab data
The sensetion blanks is included with this support.

III. Review of CLP-Like Summary Forms and Additional QA/QC Parameters

A. Holding Times/Preservation Criteria

Were holding times/preservation criteria met for all samples/analyses as indicated below?
 No.

? Yes I

Metals

180 days from date of collection, preserved to pH < 2 and 4°C

Mercury

28 days from date of collection, preserved to pH < 2 and 4°C

Cyanide

14 days from date of collection, preserved to pH > 12 and 4°C

AVS/SEM

14 days from date of collection, kept at < 4°C

If no, list the affected samples/analytes and the number of days outside of the holding time or preservation issues in the table, below.

Actions:

If the holding times were exceeded, estimate (J and UJ) positive and nondetect results. If the holding times were grossly exceeded, estimate (J) positive results and reject (R) nondetect results. If samples were improperly preserved, use professional judgment – may estimate (J and UJ) associated results.

Holding Time / Preservation Actions

Analyte	Holding Time Exceedance	Preservation Issue	Action / Blas	Affected Sample(s) / Comments
	 -	· russ		
				
			No. of the last of	
		NONE		
	}	1		
		-		
	 	 		
	_	 - 	 	
		! 		
	1	i		

	i'empuati	ue upon	receipt	t not.	recorde	d on	
	all cocs.	Most 1	ecorded	4°C.	somo	not	
	he corded, or This is be coc 11/99 summ	ll on 6,	/21/99	reclin	ed at	7°C - (Pg)) B/G
	This is be	Cause 1	vamples uniered 1	to the	taken	in the	
Duc ()	ina 12 10 10 10 17	O. Sollo	2	New. Plustion	Environmental F 1 - Fl	erefore	
	immediate. They did	not have	a chame	ce to	cool do	ron	

Data Usability Checklist Review - Inorganics Industri-Plex Site, Woburn, MA Ecological and Human Health Environmental Investigations 1999

B. Calibration

1. Instrument Calibration

Instrument calibrations were reviewed to ensure that the laboratory followed the correct method procedures.

- Review Form 14, Analysis Run Log.
- b. Were instrument calibrations performed daily for all methods/instruments used for analysis Yes / No.
- c. Were the proper number of standards used for each calibration as compliant with SW846 Method requirements Yes No.
- d. Were the calibration curves compliant with linearity requirements of the SW846 Method if a linear curve was used ($r \ge 0.995$)?

If no to any of the above, list affected samples/analytes and actions in the comment section, below.

2. Initial Calibration Verification (ICV) and Continuing Calibration Verification (CCV) Standards

All ICVs and CCVs were reviewed to assess the accuracy and sensitivity of the results.

- a. Review Form 2A, Inorganics Initial and Continuing Calibration Verification.
- b. Did all ICVs and CCVs meet the recovery criteria? Yes No. If no, list the outliers and the affected samples in the comment section, below.

Actions:

If the ICV/CCV recovery criteria exceeded the defined limits indicated below, estimate (J) associated positive results; no action is required for nondetect results. If ICV/CCV recoveries were below defined QC limits, estimate (J and UJ) associated positive and nondetect results.

90-110%

Control Limits

	мегсигу: Cyanide: AVS/SE M :	85-115% 85-115% (lab limits)	
Comments:			
	NONE		
	 		<u>-</u>

Metals:

B. Calibration (continued)

2. Low Level Standard [Contract Required Detection Limit (CRDL)] Analysis

The Low Level Standard, or Contract Required Detection Limit (CRDL), is a direct measure of the instrument sensitivity near the detection limit.

- a. Review Form 2B, Inorganic CRDL Standard for AA and ICP
- b. Were the CRDL standards analyzed at the correct concentrations? (es) No.
- c. Did all CRDL standard results meet project or lab recovery criteria? Yes No

If no, list the samples/analytes affected and actions in the table, below.

Actions:

If the CRDL recovery was greater than 150% (lab criteria), estimate (J) all positive results which were < 10x RL; no action is required for non-detects. If the CRDL recovery was less than 50% (lab criteria), estimate (J and UJ) positive and nondetect results <10x RL.

Low Level Standard (CRDL) Recovery Actions

Anal		% Recovery CRDL	Action / Bias	Affected Sample(s) / Comments
``~	··	Standard		
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		The same of the sa	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
) 		 		NoNE
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				-
}				
L				

C. Blank Results

Laboratory Blanks

Laboratory (preparation and calibration) blank results were reviewed to assess the presence of contaminants that ultimately affect the accuracy and sensitivity of the results. Blanks were assessed compared to the project-specific reporting limits (RL) listed in Table 1-7 of the Industri-Plex QAPP and to the laboratory MOLs.

- a. Review Form 3, Inorganic Blanks
- b. Were all analytes detected in the laboratory blanks at levels less than the MDL? Yes /(No.) f no, list below the analyte and blank level for the highest detected result above the MDLs.
- c. Were negative baseline drifts, if observed as negative ICB/CCB or preparation blank results, observed at absolute values less than 2x the MDL Yes No. If no, list below the analyte and blank level for the negative result with an absolute value above 2x the MDL.

Analyte	Lab Blank Result (Units)
Be	1.3 ug/L
Be	9,1 (1)
tu	6.9
Ni	20.0
Ha	0.009
1	
Cd	3.7 V
	<u> </u>
	
	
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Tab registed re-analysis of PBS for 1	CP on 7/26/99 7
into registed Re-analysis of 185 100 100 100 100 100 100 100 100 100 10	nas compliano
InorDUC doc 11/99 subset of metals - No action).	New Environmental Horizons, Inc.
	-

No actions were taken to qualify remate blank

C. Blank Results (continued)

2. Field Blank Results

Field blank results were reviewed to assess the presence of contaminants that ultimately affect the accuracy and sensitivity of the sample results.

a. Was there a field rinsate blank (RB) associated with the samples in this SDG? Yes No. If yes, list the field blank(s) and the associated samples in the table below.

Field Rinsate Blank Sample ID	Associated Field Sample IDs
Ainse Blank 6/18/99 Rinse Blank 6/18/99	5D-04, 5D-12, 5D-13 5D-03
River Blank 42179	3D-01, 3D-02
Rinse Blank 6/22/99 Rinse Blank 6/23/99	50-05, 50-05DUP 50-06, 50-07

b. Were all analytes detected in the field blank(s) at levels less than the MDL? Yes (No.) If no, list contaminants below.

NOTE: Use the maximum field blank concentration in cases where multiple field blanks are associated with the samples in a given SDG.

Field Blank ID: 🥂	inse Blant	6/17/99				1 . F
			6/18/99	6/21/99	6/22/99	6/23/99
Analyt	е	Field Blank Resu				
AL	ANC.	54 227 4al	4 63	31.9	34.5	818
56	12 9 99	2 01				7.7
Ba Be		3,5	1.7	063		1.6
Be		1.4	1.0	0.62	0.98	0.78
Cr		9.1	9.1	8.4	12.9	11.1
<u>Cu</u>		8.4	5.8	11.3	9,4	11.4
		59.6	28.5	50.9	80.8	88.8
Mn		7, 3	1 -			
Zn	 	9.8	/ 18.4	38.4	25.2	138
			-			1.4
A5					1.4	7.7
			 			(
ļ				! f		1
L		L		1	,	4

C. Blank Results (continued)

Actions:

Blank Contamination: Determine the maximum concentration of each analyte based upon a review of all laboratory blanks (preparation blanks, calibration blanks) and field rinsate blank results. Sample results which were greater than the MDL but less than 5 times the amount found in the associated blank and less than the RL are negated (qualified U). Sample results which are greater than the RL but less than 5 times the amount found in the associated blanks are qualified "B" to indicate that the analyte was also found in the associated blank(s). Data flagged "B" may be biased high. No actions are taken for results greater than 5x the blank level.

Negative Baseline Drift: Any blank reported with a negative result for which the absolute value was greater than 2x the MDL, are evaluated for this project using the absolute value of the blank result as the rule for action. If the sample result was > MDL but < the absolute value of the blank concentration, estimate the nondetect and detect results (UJ and J). These results may be biased low. No actions are taken for results greater than the absolute

value of the blank level (negative baseline drift).

value of the blank level (negative baseline drift).

value of the blank level (negative baseline drift).

Value of the blank level (negative baseline drift).

Value of the blank level (negative baseline drift).

Value of the blank level (negative baseline drift).

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Value of the blank level (negative baseline drift).

Value of the blank level (negative baseline drift).

Value of the blank level (negative baseline drift).

Value of the blank level (negative baseline drift).

Value of the blank level (negative baseline drift).

Value of the blank level (negative baseline drift). Analyte Level Concentration (Units) (Units) *2*27 NONE 7.9 63 34 S 015 0.I8 11.4 લ્કર, જ $H \cdot I$ 0.91 Mn 2n

robbed robbed highest

InorDUC.doc 11/99

New Environmental Horizons, Inc.

No Blank Actions required - all saliment

D. Matrix QC Results

Matrix Spike Recoveries

Matrix spike (MS) results were reviewed to assess the accuracy of the results relative to the specific sample matrix.

- a. Review Form 5A, Spike Sample Recovery
- b. Were matrix spike (MS) results present for all analytes at the proper frequency as required by the Site QAPP? Yes / No. Were matrix spike recovery criteria met for all analytes? Yes (No.)

List the affected analytes and actions in the table below.

Actions:

If the spike recovery was > 125%, estimate (J) all positive results. No action is taken for non-detects. If the spike recovery fell within the range of 30-74%, estimate (UJ or J) all sample results. If the spike recoveries were less than 30%, reject (R) the nondetect results as unusable and estimate (J) the positive results for extremely low bias.

If the sample concentration exceeds the spike-added concentration by a factor of 4 or more, no action is taken because the spike level was "swamped-out" by the native concentration in the sample.

Matrix Spike (MS) Accuracy Action Table

Analyte	MS % Recovery	Action	Comments/Affected Samples
AL	58.4	NONE	Sample Result > 4x Spike level
Sb	44.6	1	all results potential low bigs
A5	1878.7	NONE	Sample Result > 4x Spike level
Fe	35.0	je.	te to the te
Se	54.8	J	all results potential low bigs
		· · · · · · · · · · · · · · · · · · ·	
,	1		

Note: post-digestion spike for Se also low 58% confirms matrix suppression. Data Usability Checklist Review - Inorganics Industri-Plex Site, Woburn, MA Ecological and Human Health Environmental Investigations 1999

D. Matrix QC Results (continued)

2. Sample/Matrix Duplicate Results

Matrix (laboratory) duplicate (MD) results were reviewed to access the precision of the results relative to the specific sample matrix.

- a. Review Form 6, Inorganic Duplicates
- b. Were matrix duplicate (MD) analyses present for all analytes at the proper frequency as required by the Site QAPP? Yes No. Were criteria as defined below, met for all analytes? Yes No.

List the analytes affected and actions in the table below.

Site QAPP Control Limits: Waters RPD < 20% for results > 5x RL

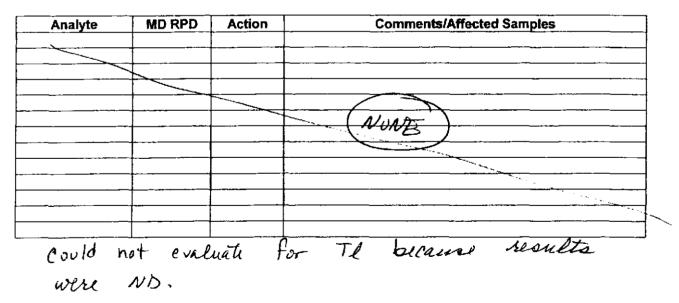
difference ± RL for results < 5x RL

difference ± 2x RL for results < 5x RL

difference ± 2x RL for results < 5x RL

Actions: Estimate (J and UJ) all results for analytes which do not meet precision criteria.

Matrix Duplicate (MD) Precision Action Table



D. Matrix QC Results (continued)

3. Field Duplicate Precision

Field duplicate sample results were reviewed to assess representativeness of the sample aliquot to the area sampled and the precision of the results relative to field sampling techniques.

 Review Form 1, Inorganic Analysis Data Sheet, for the field duplicate sample analyses results.

Actions:

If field duplicate precision exceeded criteria, below, for any analyte, estimate (J) positive results for the affected analytes in the field duplicate pair only. If severe imprecision was noted in the field duplicate results, qualify the remainder of the associated field sample data based on sound technical judgment.

Site QAPP Control Limits: Waters RPD < 30% for results > 5x RL

difference ± RL for results < 5x RL

RPD < 50% for results > 5x RL

difference ±2x RL for results < 5x RL

Use professional judgment for results < 5x RL that do not meet the RPD criteria, above. [As guidance, Region 1 defines the following control limits: control limit of $\pm 2x$ CRDL for water and $\pm 4x$ CRDL for soil for results that are < 5x CRDL.]

Field Duplicate (FD) Precision/Representativeness Action Table

FD: SD-05 SD-05 DUP

· Analyte	FD RPD	Action		Commen	ts/ As	sociate	1 Samples	
Antimony	56 %	<u> </u>	Both	results	ĺи	FD	pair	
Barium	60%		1.) L	1 %	14	T 'e	
Selenium	63%	<u> J</u>	1.	14	řζ	· Łc	ft.	
Thallium	54	5	13	l.	i,	10	4	
			ļ. <u></u>	·				
<u></u>								
								-
								-
								

evidence of heterogeneity in imprecision of several metals in Popair.

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E. Method QC

Laboratory Control Sample Recoveries

The laboratory control sample (LCS) recoveries were reviewed to assess the accuracy of the results relative to the laboratory method performance of each step during the preparation, analysis, and reporting of environmental samples.

- a. Review Form 7, Inorganic Laboratory Control Sample
- b. Was an appropriate (soil, sediment, or water) LCS performed for all analytes at the proper frequency?
 Yes No.
- c. Did all analytes meet Site QAPP recovery criteria? Yes /No.

If no, list the affected analytes and actions in the comment section, below.

Actions:

If the LCS recovery for any analyte was greater than 120% or the established upper soil or sediment control limit, estimate (J) all positive sample results. If the LCS recovery was less than 80% or less than the established lower soil or sediment control limit, estimate (J and UJ) the results. Use professional judgment if LCS is severely low (< 50%, EPA Region I criterion) to reject (R) associated results as unusable.

Comments: Soil S	NOC 12/1/95
John K samples I with singut	

E. Method QC (continued)

2. ICP Method QC - ICP Interference Check Sample Results

a. Review Form 4, ICP Interference Check Sample

ICP interference check procedures were performed to evaluate and verify the laboratory's interelement and background corrections for ICP analyses.

- b. Were analyte levels in the ICSA and ICSAB reported for all metals?

 No. Was the ICSA and ICSAB analyzed as the correct frequency as defined in SW846?

 Yes No. Did all analytes meet recovery criteria of 80-120% in the ICSAB solution? Yes No.
- c. Were the absolute values of the reported results for analytes in the ICSA check solution, other than Al, Ca, Fe, and Mg, less than 2x RL? Yes (No.)
- d. Were the major interfering analytes (Al, Ca, Fe, and Mg) within linear range of the ICP instrument? Yes / No. If no, were appropriate dilutions made to bring the interferent within linear range? Yes / No. If no, evaluate interferences based on lab IECs and Linear Range analyses and describe any actions taken, based on professional judgment and calculations to estimate the level of interference, below.

e.	Were other interfering analytes (Na) within linear range of the ICP? Yes / No. / If no, evaluate
	potential physical interferences and take actions to estimate (J and UJ) affected analytes based
	on professional judgment. Include any actions below. Sodium not required for analysis on satisfies - Paul data Samuel any of the above, list the affected samples, analytes, concentrations and actions in the section.
If no to	any of the above, list the affected samples, analytes, concentrations and actions in the section.
below.	Evalum within
0	Sudium within lenar lenar
Comments:	V at 40 yall + 46 yall in 105A range
	No Action taken because I rediment Sample
	uncentrations were areater than 10x this
	lever. also diluted + undeleted results for V
	school acceptable agreement. No evidence of
	interference. No action tiken.
	APPER DE LA CONTRACTOR

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E. Method QC (continued)

- 3. ICP Serial Dilution Results
 - a. Review Form 9, Inorganic ICP Serial Dilution
 - b. Was a field sample used for ICP serial dilution analysis Yes)! No.
 - c. Did all analytes meet criteria for %D in the serial dilution results? (Yes) No.

List the affected samples/analytes and actions in the table below.

Actions: Estimate (J) all positive results if the %D > 15% for results that are > 50x the MDL.

Serial Dilution Result Actions

l l	
NOVE	
	NONE

F. Verification of IDLs, Linear Ranges, IECs

1. Instrument Detection Limits

Analyte detection limits were reviewed to assess if the sensitivity of the results met the project-specific requirements.

- a. Review Form 10, or equivalent. For this project, Method Detection Limits (MDL) must be performed annually.
- b. Were current (annual) MDLs present for all analytes and all instruments used for analysis? Yes/ No.
- c. Were the MDLs compliant with project-specific reporting limit requirements as listed in Table 1-7 of the Site QAPP? (Yes! No.

Actions: If no, estimate (J or UJ) all affected results that are < 10X MDL due to the uncertainty in the level of detection. List any actions in the Comments section, below.

2. ICP Interelement Correction Factors

- a. Review Form 11, or equivalent, ICP Interelement Correction Factors (Annually)
- b. Were the current (annual) IECs present in the data package? Yes No.

Actions: If no, use professional judgment to determine the severity of the affect on the results.

3. ICP Linear Ranges (Annual)

- a. Review Form 12, or equivalent, ICP Linear Ranges are checked daily and updated, at a minimum, annually for this project.
- b. Were current (annual) linear range data present in the data package? (Yes) No.

Actions: If no, use professional judgment to determine the severity of the affect on the results.

If no to questions for Forms 10, 11, or 12, list the affected samples/analytes and actions in the comment section, below.

Comments:

	(at . U . 4	TOONE	1	1 2 100 7	" \\ \ ' '	10.1		
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(P X)	10 20 1/1000		Z pr		i porti		limits	
The section	1 Pri o	chan	In law	9 125 21	10000	7	111111113	
THIMALI	1	21107	TUNCA			/		
//-								

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G. Preparation and Analysis Logs

- 1. Preparation Log
 - a. Review Form 13, Inorganic Preparation Log
 - b. Were sample preparation logs present and do they contain all samples/analytes performed in the SDG? Yes No.
- 2. Analysis Run Log
 - a. Review Form 14, Inorganic Analysis Run Log
 - b. Were analysis run logs present for all required samples/methods for this SDG? Yes (No
 - c. Was the correct analytical sequence followed for the QC for each method Yes No.
 - d. Were the calibration standards (i.e., CCVs, CCBs, CRDL, ICSA, and ICSAB) analyzed at the proper frequency consistent with the Site QAPP (Yes) No.

If no to questions for Form 13 or 14, list the affected samples/analytes and actions in the comment section, below.

Missing a Form 14 for Some An analyses
by GFAA. Data are included in package - no action.

H. Additional QA/QC Issues

Percent Solids

Percent solids data were reviewed to further assess the affect of the sample matrix on result quantitation.

- Review percent solids results for all soil and sediment samples on the Form 1s. Note that a. for this project, all sediment samples were freeze-dried prior to analysis for total metals. The freeze-dried percent solids is used to calculate the total metals results on a dry-weight basis; therefore, the freeze-dried percent solids is used to compare to EPA Region I DV criteria. For AVS/SEM, the "as-received" percent solids is used as AVS is volatile and freeze-drying cannot be performed.
- were percent solids > 30% for all soil samples? Test No. after freeze-drying b.

If no, list affected samples and actions in the table, below.

Actions:

If percent solids results were > 30%, no actions are required. If percent solids were < 30% but > 10%, reject all non-detected results (R) and estimate (J) all detected results. If percent solids were <10%, reject (R) all results. Professional judgment may be used to modify these actions. For example, AVS/SEM must be analyzed on the "as received" sediment without the freeze-drying preparation because AVS is volatile and may be lost upon freeze-drying. AVS/SEM data will not be rejected due to low percent solids because the molar ratio information is useful to the ecological risk assessors even in low percent solids sediments. The data may be estimated (J and UJ) based on professional judgment.

Percent Solids Action Table

Sample ID	% Solids	Action / Comments
	<u> </u>	
	1	

Data Usability Checklist Review - Inorganics Industri-Plex Site, Woburn, MA Ecological and Human Health Environmental Investigations 1999

2. Sample Result Verification

Sample results were reviewed to assess quantitation of results near the Reporting Limits.

- a. Review all sample results on the Form 1s.
- b. Were sample results < RL flagged with a "B" by the laboratory Yes No

Uncertainty in result quantitation near the RL may exist for results that are flagged "B" because they are between the MDL and project RL.

Action: Estimate (J) all results between the lab MDL and the project RL. In other words, convert all "B" flags to "J" due to potential uncertainty near the MDL at levels below the RL. List the analytes that were affected in the table below.

Estimate (J) Results between MDL and RL $^{''}$ \mathcal{J}'' f lagged values [Convert all "B" flags from Lab to "J" for the following analytes] $< 5 \times$ MDL.

Analyte	# of affected results / matrix	Comments
2 Silver	3 Sediments	5D-01, 5D-10 5D-12
Mallium	1 2 " _	SD-07, 5D-08
Berillium	1 sediment	- 30-01'
		Aid
		Note: v
		Sumples De Moxocl
		The state of the s
	 	10/27
		12/4
		1
Rensete blan	K results that we	re 25x MDLS were
estimated	(T). Note that	B' laa hom lah on
rinsati ke	lank data did not	always Seonvert to "I"
see belon	2	7
	•	

Note: Some data were flagged "B" by lab

that were >5 x MDL. In such cases the "B"

flag was removed in the final data validation

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qualification althous.

InorDUC doc 11/99

Data Usability Checklist Review - Inorganics Industri-Plex Site, Woburn, MA Ecological and Human Health Environmental Investigations 1999

رلا				
ff. Revi	ew of Ove	rall Data P	ackage Coi	mpliance

Review of the overall data package was performed to determine if the laboratory met all EPA SW846 method and project QAPP requirements.

A. Case Narrative Review

1. Review the Case Narrative provided with the data package and list all issues of noncompliance or QA/QC exceedances addressed in the case narrative that have not been previously evaluated in the Data Usability Review. For each issue listed, state what qualification to the data has been taken.

Com	No further actions
DV. R	eview of One Sample
	review of one sample per fraction for each data package was performed to determine if sample results quantitation limits were correctly calculated and reported.
Samp	ole ID 50-01 was selected for review in this data package (Lab ID 42562-4)
	etection / Reporting Limit Review
the la	oduce the sample detection limit for one analyte for each method (ICP, GFAA, CVAA, and cyanide). Did boratory correctly calculate the detection limits? Yes / No. If no, list below the affected analytes.
Prox	incorrectly applied "B" qualifiers on some data - corrected, ect database (but not on) lab Forms 1 in lab data report). The table below any results that did not meet reporting limits requirements as listed in the Site QAPP.
Table	The table below any results that did not meet reporting white requirements as issue in the execution;

Analyte Sample ID # (s) Affected Preported (units) Well sediments met project reporting limit requisitments.

В.	Sample Result Verification - Sede went
1.	A calculation for one analyte for each method is reproduced below and compared to the result reported by the laboratory. List any discrepancies noted and actions taken. Sample ID $\frac{5D-01}{5D-01}$ ICP Analyte $1000000000000000000000000000000000000$
	Laboratory Result 188 mg/kg Calculated Result 188 mg/kg dry wt V Example Calculation: Tounded Ocean = 2.06 mg in that wt > 50 ml final volume
1	prep = 2.06 g initial wt -> 50 ml final volume inst. reading = 5843 mg/L Dil. = 10x (already included) 6738 mg/k × 50ml x 0.87 × 1000 = 187.98 GFAA Analyte Arsenic Conversion
2.	GFAA Analyte Arsenic Conversion
	Laboratory Result 12.2 mg/kg Calculated Result 12.2 mg/kg dry wt V

3. Cyanide Laboratory Result Example Salculation:

4. Mercury

Calculated Result 0.31 mg/kg dry wt pre p= 0.25 g sediment > 50 ml final volume Laboratory Result Example Calculation: 1.35 mg/x × 50 ml x 1 000 = 0.310 mg ironmental Horizons, Inc. InorDUC.doc 11/99

Data Summary Key for Data Usability Checklist Review

- The associated numerical value is an estimated quantity due to quality control criteria exceedance(s). The value is usable for project decisions as an estimated result.
- The analyte was analyzed for, but was not detected. The associated numerical value is the sample reporting/quantitation limit. The value is usable for project decisions as a nondetect result at the reporting limit.
- UJ The analyte was analyzed for, but was not detected. The associated numerical value is the sample reporting/quantitation limit and is an estimated quantity. The value is usable for project decisions as a non-detect result at the estimated reporting limit.
- Reject data due to severe or cumulative exceedance of quality control criteria. The value is unusable (analyte may or may not be present) for project decisions. Re-sampling and reanalysis is necessary for verification.
- NA Not Analyzed

List of Inorganic Data Usability Checklist Review Acronyms

CCB - Continuing Calibration Blank
CCV - Continuing Calibration Verification Sample
CLP - Contract Laboratory Program
CRDL - Contract Required Detection Limit
%D - Percent Difference
DISS - dissolved sample analysis
DQO - Data Quality Objective

EPA - Environmental Protection Agency

FB - Field Blank
FD - Field Duplicate

g - gram

ICB - Initial Calibration Blank

ICP - Inductively Coupled Plasma Spectrophotometry

ICS - Interference Check Sample

ICV - Initial Calibration Verification Sample

Kg - kilogram L - liter

LCS - Laboratory Control Limit

MD - Matrix Duplicate

mg - milligram

mg/Kg - milligram per kilogram

MS - Matrix Spike
NA - Not Applicable
ND - Non-detect
QA - Quality Assurance

QAPP - Quality Assurance Project Plan

QC - Quality Control

r - correlation coefficient of linear regression curve RB - Rinsate Blank (equipment rinsate field blank)

RL - Reporting Limit

RPD - Relative Percent Difference SDG - Sample Delivery Group

SOW - Statement of Work for Inorganic Analysis

TAL - Target Analyte List
TOT - total sample analysis
μg/Kg - micrograms per kilogram
μg/L - micrograms per liter

Data Usability Checklist Review - Inorganics Industri-Plex Site, Woburn, MA Ecological and Human Health Environmental Investigations 1999

Bibliography

Industri-Plex Trust, 1999. Toxicological Surface Water and Sediment Sampling and Fish Sampling Work Plan and Quality Assurance Project Plan for Industri-Plex Site, Woburn, Massachusetts, July 1999. Menzie, Cura & Associates, Chelmsford, MA.

USEPA, 1992. Guidance for Data Useability in Risk Assessment (Part A), Publication 9285.7-09A.

USEPA, 1994. Region I Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses, June 13, 1988, modified February 1989.

USEPA 1996. Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses.

Data Usability Review Organic Analysis by Modified Method 8270C, 8260B, 8081A, and 8082 EPA Region I Tier III – type review

Client:

Menzie-Cura & Associates, Inc.

Site:

Industri-Plex, Woburn, Massachusetts

Laboratory:

Woods Hole Group Environmental Laboratory, Raynham, MA

SDG: ETRs: 42537, 42541, 42562, and 42563

of samples/Analyses:

14 sediment samples for Volatiles, Semivolatiles, Pesticides and PCB analyses

Initial Reviewer: Dr. Nancy C. Rothman, New Environmental Horizons, Inc.

Senior Reviewer: Susan D. Chapnick, New Environmental Horizons, Inc.

12/7/99

Date Completed: October 29, 1999

The Data Usability Review, representing a Region I Tier III-type validation, was performed on the data package. The intentions of this review are: 1) to determine if the data were generated and reported in accordance with SW-846 Methods 8260B, 8270C, 8081A, 8082, the Toxicological Surface Water and Sediment Sampling and Fish Sampling Work Plan and Quality Assurance Project Plan for Industri-Plex Site, Woburn, Massachusetts, July 1999, Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses; Part II. Volatile/Semivolatile Data Validation Functional Guidelines, 12/96 2), and the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA540/R-94/012, February 1994; 2) to determine if the data met the program data quality objectives for acceptable accuracy, precision, and sensitivity; 3) to determine and define the technical usability of the data based on the accuracy, precision, and sensitivity QA/QC indicators; and 4) to update the project database with appropriate data quality qualifiers.

The Data Usability Review consists of five main sections. Section I is the Overall Summary of Data Usability including subsections addressing technical usability, accuracy, precision, and sensitivity of the data. Section II is the Data Package Completeness Review. Section III is the Review of the Laboratory Data Summary Forms and Additional QA/QC Parameters to determine if the QC requirements met and to determine the affect of exceeded QC requirements on the precision, accuracy, and sensitivity of the data. Section IV is the Review of the Overall Data Package to determine if contractual requirements were met. Section V is Example Sample Calculations to determine if the sample results and reporting limits were correctly calculated and reported by the laboratory.

I. Overall Summary of Data Usability

A. Summary of Technical Usability

All sediment results for Volatile Organics (VOC), Semivolatile Organics (SVOC), Pesticides (Pest) and Polychlorinated Biphenyls (PCBs) included in the laboratory data package reviewed, identified by Woods Hole Group Environmental Laboratory (WHG) as project numbers (ETRs) 42537, 42541, 42562 and 42563 are usable for project objectives. Results have been estimated (J and UJ) or negated (U) for several compounds in these samples due to quality control criteria exceedances. Data users should note the following uncertainties in the estimated results. The estimated results are usable for project objectives. Note that the associated rinsate blanks are included in the surface water data package. Rinsate blank results were acceptable.

B. Technical Issues Affecting Accuracy

Holding times, calibration criteria, surrogate recoveries, laboratory control sample recoveries, matrix spike/matrix spike duplicate recoveries, and other method-specific QC sample results were reviewed to evaluate the accuracy of the sediment results.

Volatile Organic Compound (VOC) Results

The accuracy for VOC for one sediment sample, SD-13, was compromised due to low surrogate recovery. The positive and non-detect results for this sample have been qualified as estimated (J and UJ) and may be biased low.

The accuracy for VOC in two sediment samples, SD-05 and SD-05DUP, was compromised due to high surrogate recoveries. The positive results for these samples have been qualified as estimated (J) and may be biased high.

The accuracy for VOC in one sediment sample, SD-03, was compromised due to low matrix spike (five out of five spikes recovered below criteria) and matrix spike duplicate recoveries (four out of five spikes recovered below criteria). Since the majority of spike compounds were low outside criteria, all positive and non-detect results were qualified as estimated (J and UJ) in the unspiked sample and may be biased low.

All other quality control information, such as holding times, LCS recoveries, and surrogate recoveries, associated with accuracy met QAPP and method criteria for the other VOC results in these sediment samples.

Semivolatile Organic Compound (SVOC) Results

Surrogate recovery in one sediment sample, SD-05DUP, was high, outside criteria for one of the Base/Neutral surrogates (2-fluorobiphenyl). The laboratory speculated that the high recovery may have been a result of a dilution required for analysis of the sample. Since the other surrogates were within criteria, no action was taken to qualify the sample data based on one of the surrogates being recovered outside of criteria.

One sample was analyzed outside of the instrument tune time (33 minutes beyond the 12-hour tune requirement). A secondary dilution of this analysis was required, due to targets over calibration range, which was done within analytical tune time. A comparison of the undiluted run with the dilution run showed good data comparability; therefore, no action was taken to qualify the undiluted sample analysis due to its being analyzed just beyond tune time.

The matrix spike (MS) and matrix spike duplicate (MSD) recoveries for 4-nitrophenol and pyrene did not meet criteria for the spiking analysis of sample SD-03. The 4-nitrophenol in the MS was high outside criteria while the MSD was acceptable. Since the sample did not report a positive result for 4-nitrophenol, no action was taken based on this finding. The MS and MSD recovery results for pyrene were 250% and 0%, respectively. The unspiked sample reported pyrene at a level over twelve times higher than the spiking level for this compound in the MS and MSD; therefore, the erratic recovery results suggest that the spiking level was inappropriate for the matrix tested. All other MS/MSD spikes were recovered within criteria. Based on professional judgement, no action was taken to qualify the unspiked sample result for pyrene based on these findings.

The Laboratory Control Sample (LCS) recovered all analytes, except pentachlorophenol, within criteria. Pentachlorophenol in the LCS was not recovered at all (0% recovery). The laboratory was asked to investigate this result and the findings were confirmed. The MS/MSD showed acceptable recovery of pentachlorophenol and the laboratory indicated that in blank matrices, that the pentachlorophenol can show poor recovery results. The other acidic components spiked into the LCS gave acceptable recovery and none of the sediment samples reported positive results for pentachlorophenol. Since the MS/MSD was acceptable for pentachlorophenol, professional judgment was used to qualify all pentachlorophenol results as estimated (UJ) and potentially biased low based on the LCS result. This action was taken instead of rejecting the non-detected data since there was evidence that the sediment matrices would have recovered the pentachlorophenol had it been present in the field samples.

A freeze-dried aliquot of Organics in Marine Sediments Standard Reference Material (SRM 1941a) was also extracted and analyzed along with the sediments within this SDG. The recovery for all the detected polynuclear aromatic hydrocarbons (PAHs) ranged from 35% to 78%. These results are an indication that the method of freeze-drying, extraction, and analysis used for the sediments was of acceptable accuracy.

All other quality control information, such as holding times and surrogate recoveries, associated with accuracy met QAPP and method criteria for the other SVOC results in these sediment samples.

Pesticide and PCB (Pest/PCB) Results

The matrix spike (MS) and matrix spike duplicate (MSD) reported low recovery of endrin in the MSD, low recovery of aldrin in the MSD, and high recovery of 4,4'-DDT in the MSD. The unspiked sample, SD-03, did not report positive results for aldrin or endrin; however, 4,4'-DDT was positively detected in the unspiked matrix. Based on these findings, the results for endrin and aldrin in SD-03 have been qualified as estimated (UJ) and may be biased low. In addition, the positive result for 4,4'-DDT in SD-03 has been qualified as estimated (J) and may be biased high.

A freeze-dried aliquot of Organics in Marine Sediments Standard Reference Material (SRM 1941a) was also extracted and analyzed along with the sediments within this SDG. The recovery of 4,4'-DDE and 4,4'-DDT was acceptable (91% and 101% recovery, respectively). However, the recovery of alpha-chlordane in the SRM was 176%. Based on this high recovery of alpha-chlordane, the positive results reported for this compound in three sediment samples, SD-03, SD-01, and SD-06, were qualified as estimated (J) and may be biased high.

All other quality control information, such as holding times, surrogate recoveries, and LCS recoveries associated with accuracy met QAPP and method criteria for the other Pest/PCB results in these sediment samples.

C. Technical Issues Affecting Precision and Representativeness

The relative percent difference (RPD) between matrix spike and matrix spike duplicate results and between field duplicate pair results were evaluated to assess precision and representativeness of the sediment data.

Volatile Organic Compound (VOC) Results

Precision was acceptable for VOC results based upon evaluation of the matrix spike (MS) and matrix spike duplicate (MSD) spike results. A comparison between the unspiked sample, MS and MSD for comparability of the non-spiked analytes indicated that precision for acetone was acceptable; however, the precision for methyl ethyl ketone did not meet criteria (%RSD = 87%). This comparison, along with low spike recovery results, as discussed in Section B, lead to qualification of all the unspiked sample results in SD-03 as estimated (J and UJ) for VOC. The acceptable precision of the MS/MSD and acetone results however, suggest that the recovery issues observed may be matrix specific.

One field duplicate pair was associated with this SDG: SD-05 and SD-05DUP. The precision between these samples was acceptable for several positive results; however, precision was compromised for cis-1,2-dichloroethene (RPD = 104.2%), trichloroethene (RPD = 75.0%), toluene (RPD = 102.7%); chlorobenzene (RPD=84.6%), ethylbenzene (RPD=86.9%), p/m-xylene (RPD=83.3%), and o-xylene (RPD=50.8%). Results were qualified as estimated (J) for the seven specific compounds listed above in both of the field duplicates due to poor duplicate precision

results. This is an indication of sediment sample heterogeneity, which may affect the representativeness of the samples for the VOC results within this SDG.

All of the sediment samples for VOC analysis had percent solids less than 30%. Sample aliquot heterogeneity in samples with percent solids of less than 30% may affect the representativeness of the sample to the site location and is often a cause of poor precision due to sample matrix heterogeneity. The sampling for volatile sediment samples was modified from Method 5035 in an attempt to appropriately deal with sediments with very low solids content (<30%). As such, the low-level preservation technique required sampling approximately 5g of sediment and placing the sample under 5mL of water (method 5035 suggests a 1:2 ratio of soil to water). The medium- or high-level preservation technique also required 1:1 methanol to sample preservation. Therefore, while Region I data validation guidelines require that data be estimated (J) and/or rejected (R) based on low % solids content of the samples, no action was taken to qualify sediment sample results based on solids content for this project (this decision was arrived at through consultation with Andy Beliveau, Region I QA Officer). The percent solids measured in the sediment samples were as follows (percent solids value obtained is reported in parentheses): SD-04 (13.2%); SD-12 (13.8%); SD-13 (27.0%); SD-03 (23.7%); SD-02 (8.8%); SD-01 (23.8%); SD-10 (22.5%); SD-11 (14.7%); SD-05 (11.0%); SD-05DUP (10.0%); SD-09 (7.2%); SD-08 (17.0%); SD-07 (10.3%); and SD-06 (18.4%).

Semivolatile Organic Compound (SVOC) Results

Precision was slightly compromised for SVOC results based upon the matrix spike (MS) and matrix spike duplicate (MSD) results. Precision as measured by the relative percent difference (RPD) was acceptable for all spikes except acenaphthene and pyrene. Acenaphthene MS/MSD reported RPD \approx 25% compared to QAPP and method criteria of RPD \leq 19%. Based on this imprecision, the result for acenaphthene in the unspiked sample (SD-03) was qualified as estimated (J). The results for pyrene, as discussed in Section B, were not deemed to be relevant since the level of spiking for this compound was not appropriate for the unspiked matrix. Therefore, even though the RPD for pyrene was 200%, no action was taken to qualify the unspiked sample data based on this result. These results are an indication of variable precision and representativeness of the sediment results in this SDG.

One field duplicate pair was associated with this SDG: SD-05 and SD-05DUP. The precision between these samples was not acceptable for all detected target analytes except for bis(2ethylhexyl)phthalate (RPD = 19.5%). The RPD for all other detected results ranged from 65% to 102% as compared to the QAPP criteria of RPD ≤ 50%. Based on this imprecision, the results phenanthrene. fluoranthene. benzo(a)anthracene, fluorene, pyrene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, benzo(b)fluoranthene, benzo(a)pyrene, benzo(g,h,i)perylene, and carbazole were qualified as estimated (J) in samples SD-05 and SD-05DUP. It should be noted that the percent solids (% solids) results of the freeze-dried sample aliquots were significantly different for these field duplicates: SD-05 % solids = 97.31% and SD-05DUP % solids = 55.07%. The "as received" % solids content of these samples, however, as measured for the volatiles analyses, were comparable (SD-05 = 11.0% and SD-05DUP =

10.0%). Additionally, only 10g of sample SD-05 was available for extraction while SD-05DUP had adequate solids to extract the full 30g aliquot required by the method. The field duplicate comparison, the MS/MSD comparison, and the variability in % solids content suggest that the field duplicate precision may have been compromised due to matrix-related variability, sampling variability, and/or due to freeze-drying and extraction variability which may have affected the SVOC results reported for all of the sediments in this SDG.

The "as received" sediments all had % solids < 30% as discussed in the VOC analysis section. The freeze-drying process removed a significant portion of the water content of these samples such that all freeze-dried % solids were > 40%. The increase in solids content of these samples allowed more solid material to undergo extraction for SVOC thereby increasing the representativeness of the sediment aliquots to the sampling points.

Pesticide/PCB (Pest/PCB) Results

Precision was slightly compromised for the Pest/PCB results based upon the matrix spike (MS) and matrix spike duplicate (MSD) results. The relative percent difference (RPD) for aldrin was 44% (compared to QAPP criteria of RPD \leq 43%) and for gamma-BHC at 68% (compared to QAPP criteria of \leq 50%). All other MS/MSD components met QAPP precision objectives. A comparison of the unspiked positively detected results reported for SD-03, the MS and the MSD gave percent relative standard deviations (%RSD) \leq 50% indicating adequate precision in the measurement of 4,4'-DDE and 4,4'-DDD in is matrix. Based on these MS/MSD results, the unspiked sample, SD-03, was qualified as estimated (UJ) for aldrin and gamma-BHC and are usable as estimated values. The precision of the analytical system appears to have been analyte dependent.

One field duplicate pair was associated with this SDG: SD-05 and SD-05DUP. The Pest/PCB results for both of these samples were all non-detect; therefore, precision from the field through analysis could not be assessed.

The "as received" sediments all had % solids < 30% as discussed in the VOC analysis section. The freeze-drying process removed a significant portion of the water content of these samples such that all freeze-dried % solids were > 40%. The increase in solids content of these samples allowed more solid material to undergo extraction for Pest/PCB thereby increasing the representativeness of the sediment aliquots to the sampling points.

D. Technical Issues Affecting Sensitivity

Blank contamination in method and field blanks, initial and continuing calibrations, and MDLs were reviewed to assess sensitivity of the results compared to QAPP reporting limits.

Volatile Organic Compound (VQC) Results

The QAPP required reporting limit (RL) for all volatile analytes was 2 μ g/kg based on a 100% solids content sample. The laboratory's lowest concentration initial calibration standard was 2 μ g/L for all components except acetone, methylene chloride, bromomethane, chloroform, carbon tetrachloride and toluene which were at variable concentrations (ranging from 2-10 μ g/L) depending on the initial calibration performed (three initial calibrations were associated with the sediment results). The reporting limits for the analytes listed above were raised, as appropriate, to the sample-specific reporting limit equivalent to the concentration of the lowest initial calibration standard employed. In addition, the sample-specific reporting limits were all elevated due to the low solids content of the sediment samples as discussed in Section C. For all samples and all analytes, the increase in reporting limits still met the Ecological and Human Health Risk Based Criteria (RBC) with the exception of vinyl chloride in SD-02 (RL = 25 μ g/kg) and SD-09 (RL = 24 μ g/kg) which still met the Ecological RBC but was slightly above the Human Health RBC (RBC = 21 μ g/kg).

The method 8260B and Region I criteria for initial calibration of percent relative standard deviation (%RSD) ≤ 30% was not met for bromomethane and methylene chloride (%RSD = 38.2% and 30.8%, respectively) for the initial calibration associated with the analysis of the Trip Blank. The cause of the non-linearity for each of these compounds was investigated and it was shown that for bromomethane, elimination of the highest point calibration standard returned the %RSD to within criteria. For methylene chloride, elimination of the lowest level calibration standard returned the %RSD to within criteria. Based on EPA Region I validation guidelines, since all results for bromomethane were non-detects, no action was taken to qualify the non-detected data since accuracy at the RL was established. For methylene chloride however, the Trip Blank result was qualified as estimated (UJ) due to uncertainty in quantitation at the sample-specific reporting limit. This estimated result is usable.

The method 8260B and Region I criteria for initial calibration of percent relative standard deviation (%RSD) \leq 30% was not met for acetone and methylene chloride (%RSD = 48.8% and 55.5%, respectively) for the initial calibration associated with the analysis of the sample SD-04. The cause of the non-linearity for each of these compounds was investigated and it was shown that elimination of neither the highest nor lowest point calibration standard returned the %RSD to within criteria. Based on this finding, the results for acetone and methylene chloride in sample SD-04 were qualified as estimated (J and UJ). These estimated data are usable for project objectives.

The method 8260B and Region I criteria for initial calibration of percent relative standard deviation (%RSD) \leq 30% was not met for acetone and methylene chloride (%RSD = 33.0% and 71%, respectively) for the initial calibration associated with the samples SD-02, SD-01, SD-10, SD-11, SD-05 SD-05DUP, SD-09, SD-08, SD-07, and SD-06. The laboratory used regression analysis on the methylene chloride which resulted in a linear formula with a regression coefficient (r^2) = 1.000; therefore, no action was required for methylene chloride results. The

cause of the non-linearity for acetone was investigated and it was shown that elimination of the lowest point calibration standard returned the %RSD to within criteria. Therefore, results reported between 10 µg/L and 200 µg/L, on a sample-specific basis, were considered usable without qualification (i.e., accepted as reported). Samples SD-02, SD-01, SD-10, SD-11, SD-05 SD-05DUP, SD-09, SD-08, and SD-07 all reported the presence of acetone within the accurate range of the initial calibration so no action was taken to qualify these data. Sample SD-06 however, reported acetone below the acceptable region of accurate quantitation; therefore, the acetone result in this sample was qualified as estimated (J). This estimated result is usable.

The method 8260B criteria for calibration verification of percent difference (%D) $\leq \pm 25\%$ was not achieved for several compounds in several continuing calibrations (see page 5-, 5A-, and 5B-VOA). Several non-detected results for bromomethane, chloromethane, vinyl chloride, methylene chloride, and acetone in ten sediment samples and the Trip Blank were qualified as estimated (UJ) due to exceedances of the %D in the continuing calibrations. These estimated non-detected results are usable.

The aqueous Trip Blank 6/17 contained trace-level acetone at 4 μ g/L and chloroform at 1 μ g/L. Several matrix-matched method blanks also reported chloroform; therefore, no action was taken to qualify the chloroform sample data based on the Trip Blank results. However, thirteen of the fourteen sediment samples did report positive results for acetone. Since this trip blank was not matrix-matched to the samples, all positive results for acetone were qualified "TB" to indicate that the Trip Blank also reported acetone as directed by Region I data validation guidelines. It should be noted that: 1) due to sampling error, only one Trip Blank was taken during the sampling of these sediments and that discrete Trip Blanks for the sampling done on June 18 through June 23, 1999 did not exist; and 2) the acetone results for nine of the sediments were quite high (> 5 x RL) and that the presence of acetone in these samples is probably not related to cross-contamination during sampling or due to sampling error.

The seven matrix-matched Method Blanks all reported trace level contamination for methylene chloride and/or chloroform. Blank action to negate sample-specific trace level methylene chloride and/or chloroform was taken for samples SD-03, SD-12, SD-13, SD-04, SD-05 and SD-05DUP (see pages 6-, 6A-, and 6B-VOA). In these samples, the level of methylene chloride and/or chloroform was raised to the sample-specific reporting limit and the result negated (U). These negated levels still meet the Ecological Risk Based Criteria for methylene chloride and chloroform and are usable.

The Internal Standard (IS) chlorobenzene-d₅, was recovered in sample SD-06 below criteria. The IS should be -50% to +100% of the IS response found in the continuing calibration; however, for this sample, the IS was -52.2% compared to the associated continuing calibration. The analytes associated with quantitation using this IS are chlorobenzene, ethylbenzene, xylenes, styrene, bromoform and 1,1,2,2-tetrachloroethane. None of these compounds were positively detected in sample SD-06. Based on this non-compliant IS response, the non-detected results for the compounds listed above have been qualified as estimated (UJ) due to the apparent loss in sensitivity of the instrument during analysis of SD-06 to this region of the chromatogram. These estimated results are usable for project objectives.

The last Internal Standard, 1,4-dichlorobenzene-d₄, was recovered low outside criteria in five samples; however, since this IS is not used for quantitation of the analytes of interest, no action was taken to qualify the sample data based on this finding.

All other VOC results met sensitivity requirements as stated in the QAPP project-specific reporting limits.

Semivolatile Organic Compound (SVOC) Results

The sediment samples received from the field all contained % solids < 30% (see Section C, VOC Results). To improve the solids content of these sediments, all samples underwent freeze-drying prior to extraction and analysis. The increase in % solids content was substantial for these samples (e.g., in SD-02, % solids increased from 8.8% as received to 92.3% after freeze-drying). This process of freeze-drying allowed more solids in the sediments to undergo extraction (improved extraction efficiency and sample representativeness) while also decreasing the reporting limits (increasing sensitivity) for analysis as compared to those limits that would have been reported if freeze-drying were not implemented.

The QAPP required reporting limit (RL) for all semivolatile analytes ranged from 170 to 420 µg/kg assuming 100% solids content in the samples. The lowest concentration initial calibration standard used by the laboratory was 2 µg/mL or 5 µg/mL, depending on the analyte. Due to limited sample size, the extraction for SVOC and Pest/PCBs was performed together and the resultant extract split between the SVOC and Pest/PCB fractions prior to cleanup and analysis. The overall extraction scheme was equivalent to 30-g sediment extracted to a final volume of 4 mL for SVOC. Using this extraction strategy, the lowest concentration calibration standard used was equivalent to a reporting limit of 270 to 670 µg/kg, on a sample-specific basis assuming 100% solids content in the sample. Increases in these reporting limits were observed due to the actual % solids content of the samples and if smaller sample sizes than 30g were used during extraction (e.g., samples SD-05 and SD-02 used 10.1g and 8.36g, respectively, during extraction due to limited availability of sample). The lowest Ecological and Human Health Risk Based Criteria (RBCs) are those associated with the polynuclear aromatic hydrocarbons (PAHs). In all samples, except SD-02, positive detects were reported for most, if not all, of the PAHs; therefore, increase in reporting limit will not affect the risk assessments. For sample SD-02, all target analytes were non-detect; however, due to the smaller than normal sample size during extraction, the reporting limits have been increased above the Ecological and Human Health RBCs.

The QAPP RL for hexachlorocyclopentadiene was 170 µg/kg; however, the lowest concentration initial calibration standard for this compound was at 5 µg/mL which corresponds to a sample-specific RL of 270 µg/kg. This compound was not detected in any sample. The laboratory incorrectly reported this compound using the 170 µg/kg RL; therefore, in all samples, the reporting limit for hexachlorocyclopentadiene was raised to the actual sample-specific limit achievable based on the lowest initial calibration standard at 5 µg/mL. Conversely, the laboratory reported all data

Industri-Plex, Woburn, MA Organic Data Usability Review

for 3-nitroaniline assuming a lowest initial calibration standard of 5 μ g/mL; however, the initial calibration showed that this analyte was present in the 2 μ g/mL calibration standard and that acceptable linearity across the initial calibration was achieved using this lowest standard. Therefore, the RL for 3-nitroaniline was lowered to the sample-specific level equivalent to the 2 μ g/mL standard and is consistent with the RL requested in the QAPP. These amended reporting limits still meet the Ecological Risk Based Criteria and are usable.

Samples SD-03, SD-11, SD-07, and SD-06 were analyzed initially without dilution of the extracts and some of the target analytes were reported at concentrations above the linear calibration region for the instrument. Dilution analyses were performed on these samples and were identified by the lab by appending an "E" suffix to the sample name. During assessment, a comparison of the undiluted analysis was made to the dilution analysis and in all cases the data were comparable. Therefore, for samples SD-03, SD-11, SD-07, and SD-06, all data reported in the electronic database is that associated with the undiluted analysis except for those analytes which were over range, in which case the dilution result has been reported for the specific analyte (i.e., the lowest possible non-detect reporting limit has been associated with these samples).

The method 8270C and Region 1 criteria for initial calibration of percent relative standard deviation (%RSD) \leq 30% was not met for hexachlorocyclopentadiene (%RSD = 33.0%), 2,4-dinitrophenol (%RSD = 72.2%), and 4,6-dintro-2-methylphenol (%RSD = 36.1%). These three compounds were not detected in any of the samples. For all three compounds, the lowest calibration standard response was the primary source for non-linearity, therefore, for all samples, the non-detected results for these compounds were qualified as estimated (UJ) due to uncertainty in quantitation near the RL. The estimated results are usable.

The method 8270C criteria for calibration verification of percent difference (%D) $\leq \pm 25\%$ was not achieved for hexachlorocyclopentadiene, 4-nitrophenol, bis(2-chloroisopropyl)ether and N-nitroso-di-n-propylamine (see page 5-SVOC). None of these compounds were positively detected in any of the samples. All samples were analyzed following this calibration; therefore, the non-detected sediment sample results for these compounds were qualified as estimated (UJ). The estimated results are usable.

The method 8270C criteria for calibration verification of percent difference (%D) $\leq \pm 25\%$ was not achieved for six compounds in one other continuing calibration. This calibration was associated with the dilution analyses for samples that had analytes over calibration range in their undiluted runs. Since none of the compounds for which the %D was outside of criteria were used in reporting data, no action was taken based on this finding.

Pesticide/PCB (Pest/PCB) Results

The QAPP required RL for all Pesticides, except methoxychlor, were 1.0 µg/kg assuming a 100% solids sample. The required reporting limits for methoxychlor and the PCBs, as aroclors, were 5.0 and 10 µg/kg, respectively. The actual sample-specific reporting limits for SD-02 and SD-05 were

elevated above these QAPP reporting limits due to limited sample size for use in extraction. Samples SD-05DUP, SD-09, and SD-07 reported elevated sample-specific reporting limits due to low % solids content of the samples. Finally, sample SD-06 reporting limits were elevated above the QAPP required limits since the sample required analysis at a dilution (1-to-10) for analysis to ensure detection of analytes within the calibration range of the instrument.

The method 8081A/8082 criteria for calibration verification of percent difference (%D) or percent Drift (%Drift) $\leq \pm 15\%$ were not achieved for several compounds in several continuing calibrations (see pages 7-, 8-, 9-, and 9A-Pest/PCB). In addition, the laboratory convention for calculation of %Drift used a formula given in Method 8000B which reversed the numerator for the calculation (Method 8000B %Drift = (Found - True)/True as compared to standard convention of (True - Found)/True); therefore, all %Drift results cited in this report used the laboratory's convention for the calculation. Several of the non-compliant continuing calibrations were ending sequence standards; therefore, no action was taken to qualify the samples analyzed prior to these standards. Only one opening sequence standard, associated with the analysis of SD-06, was non-compliant on both instrument columns/channels for methoxychlor. As a result of this non-compliance, the non-detected result for methoxychlor reported for SD-06 was qualified as estimated (UJ). This estimated non-detect result is usable.

Samples SD-03 and SD-01 were analyzed initially without dilution of the extracts and some of the target analytes were reported at concentrations above the linear calibration region for the instrument. Dilution analyses were performed on these samples and were identified by the lab by appending an "E" suffix to the sample name. For sample SD-01, all data reported in the electronic database is that associated with the undiluted analysis except for those analytes which were over range, in which case the dilution result has been reported for the specific analyte (i.e., the lowest possible non-detect reporting limit has been associated with these samples). For sample SD-03, the dilution analysis also reported detection of alpha-chlordane, which was not able to be detected in the undiluted analysis due to matrix interference. Therefore, for sample SD-03, the dilution analysis was used to report the alpha-chlordane result and any results for analytes that were over range on the initial analysis. All other results in the electronic database are those associated with the undiluted analysis for sample SD-03.

E. Additional Technical and QA/QC Issues

A review of method compliance, an evaluation of method modifications, and other QA/QC issues were made to evaluate the comparability of the data generated for the project uses.

Volatile Organic Compound (VOC) Results

The Form 5s, showing BFB Tune summary criteria, erroneously show the latest CLP SOW criteria for tune acceptance. The raw data from the GC/MS system accurately has the 8260B criteria and all tunes did meet these criteria. This is a reporting form error that the laboratory is aware of but can not fix using the software they currently employ.

Industri-Plex, Woburn, MA Organic Data Usability Review

The laboratory used the surrogate 1,2-dichloroethane-d₄ in place of the QAPP suggested surrogate dibromofluoromethane (two other surrogates were the same as suggested in the QAPP). In addition, the laboratory acceptance criteria for surrogate and MS/MSD recoveries were based on laboratory control charted limits as required by Method 8260B. These laboratory limits were in most cases tighter than those given in the QAPP and in all cases, were technically acceptable compared to the QAPP criteria.

The low-level analysis of samples SD-05 and SD-05DUP reported results for acetone that were above the calibration range of the instrument. Since dilution analysis using low-level Method 5035 sample preservation is not possible, the laboratory analyzed the high-level methanol extract of samples SD-05 and SD-05DUP. In these high-level analyses, the reported values for acetone were considerably different from the low-level analyses (~10-20 times higher in the high-level analyses as compared to the low-level analyses). Since there was no methanol Trip Blank associated with these high-level samples to determine if the elevated acetone was sampling related and since the low-level acetone results were reported < 40% above the highest level calibration standard, professional judgment was used to accept the low-level acetone results with qualification as being estimates (J) due to quantitation above the calibration range of the instrument.

The low-level analysis of samples SD-05 and SD-05DUP reported results for benzene that were considerably above the calibration range of the instrument (> 500% higher than highest calibration standard). Since dilution analysis using low-level Method 5035 sample preservation is not possible, the laboratory analyzed the high-level methanol extract of samples SD-05 and SD-05DUP. A comparison of the data between the high-level analyses and the low-level analyses indicate that the benzene results were comparable. The laboratory reported the results of the high-level analyses based upon the amount of methanol used for preservation and did not account for the amount of water from the sample that may also be acting to dilute the sample during analysis (the laboratory properly reported the data as they are required, not accounting for the sample moisture content in their calculations). During this assessment however, the benzene results were recalculated, as suggested by the Massachusetts Department of Environmental Protection and Andy Beliveau (Region I QA Officer) to factor in the sample water content. The laboratory reported values for benzene in the high-level SD-05 and SD-05DUP were 27,000 and 29,000 μg/kg, respectively. Using the percent moisture content of these samples (see Section C), the benzene results were recalculated for SD-05 and SD-05DUP as 43,000 and 48,000 µg/kg, respectively. recalculated values for benzene were associated in the database with samples SD-05 and SD-05DUP. All other results for VOCs for these samples were reported from the low-level analyses.

Semivolatile Organic Compound (SVOC) Results

For semivolatile analysis, the laboratory spiked only the Base/Neutral surrogates into the samples prior to extraction. This was done because limited sample size required that the semivolatiles, pesticides and PCBs be extracted together and addition of the Acid surrogates would interfere with pesticide analysis. Andy Beliveau, Region 1 QA Officer, was contacted about this spiking protocol and it was decided that action would be taken for the acidic semivolatile compounds if and only if the other QC elements, such as LCS and MS/MSD, showed poor acid compound recovery.

The Form 5s, showing DFTPP Tune summary criteria, erroneously show the latest CLP SOW criteria for tune acceptance. The raw data from the GC/MS system accurately has the 8270C criteria and all tunes did meet these criteria. This is a reporting form error that the laboratory is aware of but can not be fix using the software they currently employ.

Pesticide/PCB (Pest/PCB) Results

For Pesticide/PCB analysis, the laboratory used second-order curve statistics to develop the initial calibrations. An initial evaluation of the Pesticide calibrations showed that the laboratory had erroneously forced the curves through the origin during their curve statistics processing. The origin was not used in the PCB initial calibration curve processing. The laboratory was contacted on September 24, 1999 (Resubmittal issued) and they were asked to reprocess all initial calibrations without using the origin as a calibration point, to reprocess all continuing calibrations, and to reprocess any sample data which may have been affected by a change in calibration (e.g., no sample data required reprocessing since all results were non-detects; however, laboratory control spikes (LCS) and MS/MSD did require reprocessing). On October 11, 1999, reprocessed data were received for Pesticides and these data were inserted in the data package (the original data are included in the project files for documentation only). Note that this regeneration process resulted in different continuing calibration results in some cases. NEH initiated a corrective action and the laboratory has changed their Pesticides calibration to ensure that all future work does not force the calibration curves through the origin.

The pesticide and PCB analyses were performed on the same extract using a single long analysis run time to allow the determination of the pesticides and PCBs without interference. As such, the MS/MSD performed was done using only pesticide spikes – no PCB MS/MSD was performed. In addition, the laboratory used laboratory generated recovery acceptance criteria for the MS/MSD (and LCS) which were actually tighter than those given in the QAPP. Therefore, the laboratory limits for MS/MSD were considered acceptable for project objectives.

The precision acceptance criteria for the MS/MSD (RPD) were set by the laboratory at 50% on their report forms. This is greater than the acceptable RPD for precision defined in the Site QAPP for several analytes (criteria ranged from 31% to 50% for different pesticide MS compounds). The laboratory was contacted and it was determined that the 50% level was an arbitrary precision value (not based on control charting); therefore, precision objectives during this assessment were judged versus those given in the QAPP and not based on the laboratory-reported precision criteria.

During assessment, a check of raw data to final reported data and to electronic data was made which uncovered two reporting errors. Resubmittals were issued to the laboratory to investigate the issues and to re-report the data properly. On October 28, 1999, the laboratory resubmitted corrected results pages for samples SD-01E and SD-02, which have been inserted into the data package. NEH initiated a corrective action requiring the laboratory in the future to submit their Pesticides worksheets along with the sample data sheets to ensure that correct transposition from the worksheet to the final data sheet is made.

Industri-Plex, Woburn, MA Organic Data Usability Review

The laboratory qualified data using a "P" or "I" qualifier to indicate that the results from the two channels (columns) differed by more than 40% RPD. The "P" qualifier indicated that the higher of the two values detected was chosen for final reporting of results. The "I" qualifier indicated that the lower of the two values detected was chosen for final reporting of results since interference on the non-chosen channel existed causing the high RPD. An evaluation of the laboratory qualified "P" and "I" data was made during assessment and all "I" data were accepted and the results reported in the electronic database without qualification (i.e., the final data usability qualification of results removed the "I" qualifier). For all samples, except SD-06, any data reported with the "P" qualifier were also accepted without qualification since the RPDs were <50% (technical judgment limit based upon QAPP precision criteria). However, for sample SD-06, the RPDs for gamma-chlordane and 4,4'-DDD were 51% and 55%, respectively; therefore, the results for these two compounds in sample SD-06 were qualified as estimated (J) and may be biased high.

F. Summary of Completeness, Documentation, and Chain-of-Custody Issues

Chain-of-custody (COC) documentation of temperature on receipt at the laboratory was missing for several COCs. For samples received 6/21/99, a receipt temperature of 7° C was recorded. This exceeds the criterion of 4 ± 2 °C. The samples were collected in the summer and immediately sent via courier to the laboratory. Only surface water samples were collected associated with this COC. It appears that they did not have a chance to cool-down completely by the time they were received at the laboratory. No action was taken other than to note this discrepancy.

Due to a sampling miscommunication, a Trip Blank for volatiles analysis associated with the sediments was not taken on each day of sampling. A water Trip Blank accompanied the first shipment of samples to the laboratory (called Trip Blank 6/17). No Trip Blanks were received with the sediment sampling events on June 18 through June 23, 1999. The one Trip Blank received was associated with all of the sediments within this project.

Indication of "sediment" or "surface water" for the association of the five rinsate blanks was not made on the chain-of-custodies. However, personal communication with the sampler, Peter Kane of Woods Hole Group Environmental Laboratory, confirmed that the rinsate blanks were taken as rinses of the Eckman grab samplers used for sediment collection.

Times of sampling were not recorded on the chain-of-custody's for the sampling done on June 21 through June 23, 1999.

The sampling date information was incorrect in the excel database file of results (generated by the laboratory) for several samples. The corrected information was added to the sample results, as well as the % solids content of the samples analyzed, during this assessment. The project data file was made complete and compliant with these corrections.

Industri-Plex, Woburn, MA Organic Data Usability Review

The laboratory reported results for several analytes at a level below their reporting limit and qualified the data as estimated (J) due to uncertainty in quantitation. During this Data Usability Review, the "J" qualifier on data of this type was accepted, unless otherwise negated by actions taken during assessment, and was associated with the final results (i.e., the "J" was carried forward to the final data usability qualification of results).

NEH generated a data summary table based on the project data file supplied by the laboratory including the corrections and qualifications added to the data based on this Data Usability Review. The data summary table of technically valid and usable results for sediments reviewed by NEH is attached to this report.

Industri-Plex 1999

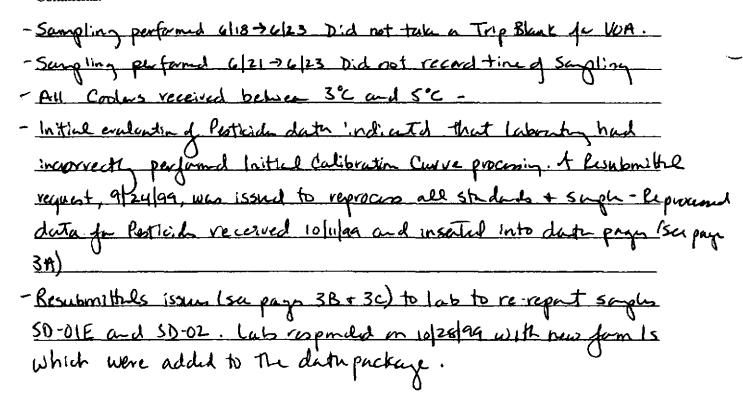
Organic Data Usability Review Sediments

II. Data Package Completeness

The data package is reviewed for completeness using the Toxicological Surface Water and Sediment Sampling and Fish Sampling Work Plan and Quality Assurance Project Plan for Industri-Plex Site, Woburn, Massachusetts, July 1999.

- 1. Were all required reporting forms and associated raw data included in the data package? (Yes) No. If no, contact laboratory for resubmittals and attach copy of resubmittal request to this checklist.
- 2. Was the data accompanied by a Data Review Checklist / Project Narrative explaining any non-compliance issues with the analyses (Yes) No. Was the narrative complete? Yes / No.
- 3. Were all samples listed in the laboratory data review checklists included in the data package? No. Were all sample analyses requested on the Traffic report and Chain-of-Custody performed by the laboratory? Yes No. Were there any Chain-of-custody deviations noted? (e.g., labeling discrepancy between sample jar and COC, temperature outside of requirements, etc.) Yes / No. See be a

Comments:





To:	Held	lar Costa, WHG		From:	Nancy C. Rothman, I	Ph.D.
Fax:	508-	822-3288		Pages:	1	
Phone	508-	822-9300		Dete:	September 24, 1999	
Re:	Res	ubmittal Request		CC:	Susan D. Chapnick	
	Indu	stri-Plex Data				
	Org	anics				
√ Urge	nt	☐ For Review	☐ Please Con	ment	☐ Please Reply	☐ Please Recycle
Thic Do		nittal Bagyant is to do	cument and con	firm my t	elenhone conversatio	o today with Pata

This Resubmittal Request is to document and confirm my telephone conversation today with Pete Kane regarding the issue below.

Pesticide Calibration data

In performing my review of the Pesticide's work on Industri-Plex, I saw that the initial calibrations for the Pesticides used calibration curve statistics for verifying the initial calibration and for performing quantitation of the Pesticides. All of the compounds reviewed used curves (i.e., not average Calibration Factors) and all indicate that the curve statistics were derived by FORCING THE CURVE THROUGH THE ORIGIN. This is unacceptable – the curves may NEVER be forced through the origin for a valid calibration. I reviewed the electronic files you sent on Industri-Plex and see that for several samples across all of the data submitted, that Pesticides were detected. These data need to be reprocessed using the correct calibration technique, re-quantitated, and re-reported. Please ensure that all of your staff (GC and GC/MS) know that curves may NOT be forced through the origin if used. I did a cursory check on the VOA and SVOC data and think that average RRFs were used here; however, expect a resubmittal request for these analyses if I do see any curve data.

Thank you for your prompt response to this resubmittal. Please forward your response to:

Nancy C. Rothman NEH, Inc. 34 Pheasant Run Drive Skillman, NJ 08558 phone: 908-874-5686 fax: 908-874-4786 34 Pheasant Run Drive, Skillman, NJ 08558 63 College Avenue, Arlington, MA 02474 Phone: (908) 874-5686 ◊ (781) 643-4294 ◊ Fax: (908) 874-4786 Email: NCR@bt.netcom.com ◊ Chapnick@world.std.com

New Environmental Horizons, Inc.



√ Urge	nt	☐ For Review	☐ Please Comme	ent	☐ Please Reply	☐ Please Recycle
	Org	anics				
	Indu	ıstri-Plex Data				
Re:	Res	submittal Request	CC	C:	Susan D. Chapnick	
Phonec	508	-822-9300	De	ite:	October 22, 1999	
Fax:	508	-822-3288	Pa	ges:	1	
To:	Hek	dar Costa, WHG	Fn	om:	Nancy C. Rothman, I	Ph.D.

Sediment Sample 42562-4 and 42562-4E Pesticides

In performing the review of the data, I see that the original sample run, 42562-4 reports that 4,4'-DDE is over calibration range (flagged E). The dilution analysis, 42562-4E, chromatograms (Channel A and B) appear to call 4,4'-DDE; however, the datasheet indicates that 4,4'-DDE is not detected at 19U. I believe that this is in error. Instead, I think the 4,4'-DDE should have been reported at 470 ug/kg. Please review this data. If you are in agreement with my evaluation, please revise the datasheet for this sample to report 4,4'-DDE properly.

Thank you for your prompt response to this resubmittal. Please forward your response to:

Nancy C. Rothman NEH, Inc. 34 Pheasant Run Drive Skillman, NJ 08558 phone: 908-874-5686 fax: 908-874-4786 34 Phessant Run Drive, Skillman, NJ 08558 63 College Avenue, Arlington, MA 02474 Phone: (908) 874-5686 ◊ (781) 643-4294 ◊ Fax: (908) 874-4786 Email: NCR@bt.netcom.com ◊ Chapnick@world.std.com

New Environmental Horizons, Inc.



√ Urgei	nt	☐ For Review	☐ Please Co	mment	☐ Please Reply	☐ Please Recycle
	Org	anics				
	Indi	ustri-Plex Data				
Re:	Res	submittal Request		CC:	Susan D. Chapnick	
Phone:	508	-822-9300	···	Date:	October 25, 1999	
Fax:	508	-822-3288		Pages:	1	
To:	Hele	dar Costa, WHG		From:	Nancy C. Rothman, I	Ph.D.

Sediment Sample 42562-1 Pesticides

In performing the review of the data, I see that the original sample before reprocessing reported 4,4'-DDD at 26 ug/kg (this is also what was reported on the electronic file). The reprocessed data reports 4,4'-DDD at 13 ug/kg; however, the worksheet indicates that the result should really have been reported at 25 ug/kg. Please review the reprocessed data (pages R944 and R945) and if I am correct, please submit an amended Form 1 for this sample with the correct result for 4,4'-DDD.

Thank you for your prompt response to this resubmittal. Please forward your response to:

Nancy C. Rothman NEH, Inc. 34 Pheasant Run Drive Skillman, NJ 08558 phone: 908-874-5686 fax: 908-874-4786

Organic Data Usability Review

Data Summary Key for Data Usability Checklist Review

- The associated numerical value is an estimated quantity due to quality control criteria exceedance(s).
 The value is usable for project decisions as an estimated result.
- The compound was analyzed for, but was not detected. The associated numerical value is the sample
 detection/quantitation limit. The value is usable for project decisions as a nondetect result at the
 reported detection/quantitation limit.
- UJ The compound was analyzed for, but was not detected. The associated numerical value is the sample
 detection/quantitation limit and is an estimated quantity. The value is usable for project decisions as
 a nondetect result at the estimated detection/quantitation limit.
- Reject data due to severe or cumulative exceedance of quality control criteria. The value is unusable (compound may or may not be present) for project decisions. Resampling and reanalysis is necessary for verification.
- TB The compound was detected in a Trip Blank
- EB The compound was detected in an Equipment Blank.
- BB The compound was detected in a Bottle Blank.
- NA Not Analyzed

Organic Data Usability Review

Validation Checklist Review Acronyms

BB - Bottle Blank

CCAL - Continuing Calibration

CLP - Contract Laboratory Program

%D - Percent Difference = $(A - B)/A \times 100$

%Drift - Percent Drift = Percent Recovery = ((True-Found)/True X 100)

DQO - Data Quality Objective
EB - Equipment Blank (Rinsate)

EPA - Environmental Protection Agency

FB - field blank

g - gram

GC/MS - Gas Chromatography/Mass Spectrometry

ICAL - Initial Calibration

Kg - kilogram L - liter

LCS - Laboratory Control Sample
MDL Method Detection Limit

MS - Matrix Spike

MSD - Matrix Spike Duplicate

mg - milligram
NA - not applicable
ND - non-detect

QA - Quality Assurance
QC - Quality Control
RL Reporting Limit

RPD - Relative Percent Difference ([(| A-B |) ½ (A + B)] X 100)

%RSD - Percent Relative Standard Deviation (SD/Average Value X 100)

SRM - Standard Reference Material
SVOC - Semivolatile Organic Compound

TCL - Target Compound List

TIC - Tentatively Identified Compounds

μg/Kg - micrograms per kilogram μg/L - micrograms per liter

Organic Data Usability Review

Bibliography

Toxicological Surface Water and Sediment Sampling and Fish Sampling Work Plan and Quality Assurance Project Plan for Industri-Plex Site, Woburn, Massachusetts, July 1999.

Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses; Part II. Volatile/Semivolatile Data Validation Functional Guidelines, 12/96.

Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Updates II and III (USEPA, Office of Solid Waste and Emergency Response, Washington, DC, September 1995 and December 1996). Methods 8260B, 8270C, 8081A, and 8082.

USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. EPA540/R-94/012, February 1994.

¹.xls SITE Org, Page 1 of

Bromoform

1,1,2,2-Tetrachloroethane

Site Locations - Orga.

urn. MA Sediment Data Validated 12 79

NE ıC. SD-13 Sample Location ID: SD-11 SD-10 SD-09 SD-08 42537-7 Lab_ID: 42562-9 42562-7 42563-6 42563-8 06/17/99 lον 06/21/99 Date Sampled: Lab Lab DΛ 06/21/99 Lab DΥ 06/22/99 DV 06/22/99 Lab lov Lab Units: ug/Kg drywt Qual. Qual. µg/Kg drywt Qual. Qual µg/Kg drywt Qual. Qual μg/Kg drywt Qual. µg/Kg drywt Qual. Qual. "As-Received" Sediment %solids 27.0% 14.7% 22.5% 7.2% 17.0% Analyte-Volatile Organic Compounds (VOC) EPA Method 5035 (modified) and 8260B 6 U UJ Chloromethane ŀυ 14 U 10 U 24 U UJ 19 U IJ UJ Vinyl chloride 6 U 14 U u 24 U 10 U 19 U u. IJ 31 U Bromomethane 14 U lυ 10 U 24 U U 19|U บป lu 6¦U 14 U Chloroethane 10 U 24 U 19 U 290 JTB ТВ Acetone 230 58 TB 470 TΒ ТВ 1400 6 U UJ Ü 1.1-Dichloroethene 14 U 10 U 24 U 19 U U 6 U UJ U Carbon disulfide 14 U 10 U 24 U 13 J Methylene chłoride 15 JB UJ 24 U 34 U 59 U U 47 U 6 U trans-1.2-Dichloroethene UJ 10 U 14 U 24 U U 19 U U 1.1-Dichloroethane 6 U UJ 14 U U 10 U U 24 U 19 U Ù. 2-Butanone (MEK) 89 14 U 10 U lu 24 U 340 cis-1.2-Dichloroethene 6 U IJ 14 U 10 0 24 U 19 U Chloroform 15 U IJ 14 U 10 U 24 U 19 U U 6 U IJ 1.1.1-Trichloroethane U 10 U u 14 U 24 U 19 U U 6 U IJ Carbon tetrachloride 14 U 10 U 24 U 19 U U 6 U UJ Benzene 10 U 9 J 14 U 41 UJ 6 U 1,2-Dichloroethane 14 U 10 U Ų 24 U 19 U U Trichloroethene 6 U UJ 14 U 10 U 24 U υ 19 U ĺU 6:U UJ i,2-Dichloropropале 14 U 24 U 10 U U 19 U U UJ Bromodichloromethane 6İU 24 U 14 U 10 U U 19[!]U U 6 U UJ Methyl isobutyl ketone (MIBK) 14|U U 10 U U 24 U U 19¦U U cis-1,3-Dichloropropene 6 U ŲJ 24 U 14 U 10 U U u 19 U 6 U IJ Toluene 14 U 10 U U Ü 24 U 19 U trans-1,3-Dichloropropene 6 U IJ 10 U 14 U 24 U U 19 U 1.1.2-Trichloroethane 6|U UJ 14 U 10 U U 24 U u 19:U 6 U UЛ u 2-Hexanone 14 U 10 U 24 U 19 U Ü 6 U UJ Tetrachloroethene 14 U U 10 U 24 U 19!U Ū 6 U Dibromochloromethane $\pm UJ$ 14 U 10 U 19 U 24 U 6 U Chlorobenzene :UJ 14 U 10 U 24 U 19 U Ü Ethylbenzene 6!U LU 14 U 10 U 24 U 19 U U 12 U IJ p/m-Xviene 27 U U 47 U U 19 U 37 U IJ o-Xylene 6 U 24 U 14 U U 10 U U 19 U Ü Styrene 6 U UJ 14 U 10 U u 24 U U 19 U U

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Sample Location ID:	SD-07			SD-06		i -
Lab_ID:	42563-11			42563-13	• 	i
Date Sampled:	06/23/99	Lab	DV	06/23/99	Lab	DV
Units:	µg/Kg drywt	Qual.	Qual.	µg/Kg drywt	Qual	Qual.
"As-Received" Sediment %solids:	10.3%			18.4%	İ	
Analyte-Volatile Organic Compounds (VOC)			ļ			
EPA Method 5035 (modified) and 8260B		i i	-			
Chloromethane	17	U	UJ	6	υ	ΠJ
Vinyl chloride	17	U	เม	6	U	υJ
Bromomethane	17	U	UJ	6	υ	UJ
Chloroethane	17	U	U	6	U	U
Acetone	150		тв	31		JTB
1,1-Dichloroethene	17	Ü	U	6	U	U
Carbon disulfide	20			17		ļ
Methylene chloride	44	U	UJ	16	U	UJ.
trans-1,2-Dichloroethene	17	U	U	6	U	U
1,1-Dichloroethane	45			27		1
2-Butanone (MEK)	17	U	U	6	U	U
cis-1,2-Dichloroethene	10	J	J	18		
Chloroform	17	U	U	6	U	Ū
1,1,1-Trichloroethane	17	U	U	6	υ	U
Carbon tetrachloride	17	U	U	6	U	U
Benzene	9	J	J	6	U	U
1,2-Dichloroethane	17	U	U	6	U	U
Trichloroethene	17	U	u	11		
1,2-Dichloropropane	17	U	U	6	U	U
Bromodichloromethane	17	U	U	6	U	U
Methyl isobutyl ketone (MIBK)	17	U	U	6	U	U
cis-1,3-Dichloropropene	17	U	U	6	U	U
Toluene	17	U	u	6	U	U
trans-1,3-Dichloropropene	17	U	U	6	U	υ
1,1,2-Trichloroethane	17	U	U	6	U	U
2-Hexanone	17	U	U	6	U	U
Tetrachloroethene	17	U	u	6	U	ļυ
Dibromochloromethane	17	U	U	6	U	U
Chlorobenzene	17	U	U	6	U	UJ
Ethylbenzene	17	U	U	6	U	υJ
p/m-Xylene	35	U	u	13	U	ŲĴ
o-Xylene	17	U	U	6	U	ΟJ
Styrene	17	U	U	6	U	UJ
Bromoform	17	U	U	6	U	UJ
1,1,2,2-Tetrachloroethane	17	U	U	6	U	UJ

REFERENCE Org_sed.xls
Page 1 of 1

Industri-Plex, Y arn, MA
Reference Locations - O. ...ic Sediment Data

Validated 17

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		11011	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Locations	- 01	٠١١٠ پ	Jeument	Data						INE	=, .IC
Sample Location ID:	SD-01			SD-02			SD-03			SD-04			SD-12		
Lab_ID:	42562-5			42562-2			42541-2			42537-2			42537-5	Ţ	:
Date Sampled:	06/21/99	Lab	DV	06/21/99	Lab	DV	06/18/99	Lab	DV	06/17/99	Lab	DV	06/17/99	Lab	DV
Units:	µg/Kg drywt		Qual.		Qual.	Qual.	µg/Kg drywt	Qual.	Qual.	µg/Kg drywt	Qual.	Qual.	µg/Kg drywt	Qual.	Qual.
"As Received" Percent solid (%)::	23.8%			8.8%			23.7%			13.2%			13.8%		
Analyte-Volatile Organic Compounds (VOC)	ļ 			,											1
EPA Method 5035 (modified) and 8260B															
Chloromethane	10	U	Ų	25	U	U	7	Ų	UJ	13	Ú	Ü	17	Ų	UJ
Vinyl chloride	10	U	U	25	U	U	7	Ų	UJ	13	U	Ų	17	U	U
Bromomethane	10	U	U	25	U	U	36	U	ΩJ	13	U	UJ	84	U	UJ
Chloroethane	10	U	U	25	U	U	7	Ų	UJ	13	U	U	17	U	U
Acetone	120		ТВ	2200		TB	210		JTB	34	U	UJ	670		TB
1,1-Dichloroethene	10	U	U	25	Ų	U	7	U	บม	13	U	U		U	U
Carbon disulfide	10	U	u	25	U	U	 	Ų	UJ	13	U	Ü	t	u	U
Methylene chloride	24	U	U	63		U		JB	UJ		JB	IJ		JB	U
trans-1,2-Dichloroethene	10	U	U	25	U	U	7	Ų	UJ	13	U	U	 	U	U
1,1-Dichloroethane	10	U	U	25	U	U	<u> </u>	U	uj	13	+	Ū		Ιυ	u
2-Butanone (MEK)	10	U	U	680			60	+	J	13	-	U	230	+	
cis-1,2-Dichloroethene	10	U	U	25	U	U		U	UJ	13		u	.	U	U
Chloroform	10	Ų	U	25		u	18		UJ		JB	u		U	u
1,1,1-Trichloroethane	10		U	25		u		U	uj	13		U		u	u
Carbon tetrachloride	10	U	U	25		lu	7	Ų	UJ	34		U		Ū	U
Benzene	10	U	U	25		U	7	U	UJ	13	U	U	+	U	u
1,2-Dichloroethane	10	Ū	U	25		u		U	UJ	13		Ū		U	u
Trichloroethene	: 10	U	U	25		U		Ų	UJ	13	·	U		U	Ü
1,2-Dichloropropane	10	U	U	25		U		U	UJ	13	 .	U	 	U	U
Bromodichloromethane	10		U	25		lυ	·	U	UJ	13		U	1	U	U
Methyl isobutyl ketone (MIBK)	10	U	U	25		Ū	 	U	UJ	13	+	Ü	·	Ų	Ų
cis-1,3-Dichloropropene	10	U	u	25		U		U	UJ	13		U		†u—	U
Toluene	10	U	u	25		lü —		u	UJ	34	+	U		Ū	iu –
trans-1,3-Dichloropropene	10		U	25		υ	·	U	บม	13	 	υ		u	u u
1,1,2-Trichloroethane	10		u	25		lu		u	UJ	13		U		U	<u> </u>
2-Hexanone	10	-	U	25		tu		U	UJ	13		u	 -	u	U
Tetrachioroethene	10		U	25		u u		U	UJ	13	+	U	 	<u> </u>	U
Dibromochloromethane	10	 	U	25		Ū	 	U	UJ	13	+	U		U	
Chlorobenzene	10	1	U	25		lū —		Ū	nn n	13	<u> </u>	U	d —	U	†Մ
Ethylbenzene	10		Ū	25		U		U	(n)	13		U		U	U
p/m-Xylene	19		u	50		U	15		01	27		U		U	U
o-Xylene	10		Ū	25		t u	· · · · · · · · · · · · · · · · · · ·	Ü	lui On	13		U		u	U
Styrene	10		U	25		Ū		U	nn	13		Ü		<u></u>	U
Bromoform	1 10	 	U	25		U	t	U	n1	13	+	U			
1,1,2,2-Tetrachloroethane	10	 -	U	25		u		Ü	O1	13		U		U	U

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Page 1 of 6		Sit	<u>te Loca</u>	tions - Orga	nic S	<u>edimer</u>						
Sample Location ID:	SD-13		4	SD-11		-	SD-10	Ĺ		SD-09	i	
Lab_ID:	42537-6		ļ	42562-8			42562-6			42563-5	i	
Date Sampled:	06/17/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/22/99	Lab	DV
Units:		Qual.	Qual.	ug/Kg drywt	Qual.	Qual.	µg/Kg drywt	Qual.	Qual.	µg/Kg drywt	Qual.	Qua
Freeze-Dried Sediment %solids:	79.1%			81.3%			78.7%	i 		41.7%		
Analyte-Semivolatile Organic Compounds (S	SVOC)											
EPA Method 8270C												
bis(2-Chloroethyl)ether	330	Ü	U	330	U	U	340	u	U	640	U	U
Phenol	330	U	U	330	U	U	340	U	U	640	U	U
2-Chlorophenol	330	U	U	330	U	U	340	U	U	640	U	U
1,3-Dichlorobenzene	330	U	U	330	U	U	340	U	10	640		Ū
1,4-Dichlorobenzene	330	U	U	330	.U		340		-	640		Ťu
1,2-Dichlorobenzene	330	U	U	330		u	340		U	640	F	U
bis(2-chloroisopropyl)ether	330	U	UJ	330		UJ	340	+	UJ	640		UJ
Hexachioroethane	330	U	u	330	+	U	340	·	U	640		U
N-Nitroso-di-n-propylamine	330	U	UJ	330		บั้	340		UJ	640	 -	UJ
Nitrobenzene	330	υ	U	330	U	U	340		U	640		Tu -
Isophorone	330	U	lu	330	U	Ū.	340		u	640	+	Ju-
2-Nitrophenol	330	U	U	330	U	U	340	-	U	640	·	u
2,4-Dimethylphenol	330	U	U	330		Ū	340		Ū	640		lu -
bis(2-Chloroethoxy)methane	330	U	- υ	330		- u	340	-	Ü	640	+	u
2,4-Dichlorophenol	330	υ	U	330	,	- lu	340		Ū	640	+	u
1,2,4-Trichlorobenzene	330	υ	U	330	+ 	Ū	340	+	U	640		U
Naphthalene	90	J	- 	120		J	340	 	Ü	640	 -	Tu-
Hexachlorobutadiene	330	Ū	Tu Tu	330		U	340		U	640	-	u
4-Chloro-3-methylphenoi	330	U	- lu	330	 	u u	340		u	640		- lu
Hexachlorocyclopentadiene	840	U	UJ	810		UJ	840	-	UJ UJ	1600		UJ
2,4,6-Trichlorophenol	330	U	U	330		u	340	-	U	640	+	- U
2-Chloronaphthalene	330	U	u	330		Ū	340		U	640	-	lu
Acenaphthylene	110	j	- - <u> </u>	98		1.	340		U	640	 	- U
Dimethylphthalate	330	U	u	330	↓	- U	340	+	U	640		u
2,6-Dinitrotoluene	330	ا —	 	330		lu -	340	_	- 0	640		- U
Acenaphthene	100	,	l j –	240	+	<u> </u>	340		U	640	ļ	- u
2,4-Dinitrophenol	840	U	UJ	810		UJ	840	 -	UJ	1600		UJ.
2,4-Dinitrotoluene	330	u -	u	330	·	- U	340	-	U	640	i 	U
4-Nitrophenol	840	Ū	עט	810	+	nn n	840		nn n	1600	 .	UJ
Fluorene	120	-	1,	370	+		340		03	640		U
4-Chlorophenyl-phenylether		U	<u> </u>	330	+	lu	340		U			u u
Diethylphthalate		U	U	460		 -	340	 	U	640	 	U -
4,6-Dinitro-2-methylphenol	··· · — 	U	O3	810		UJ			nn In	640	+	
n-Nitrosodiphenylamine	330	U -	103			+	840		103	1600		บบ
4-Bromophenyl-phenylether	330	υ	U	170 330	+··	J.	100 340		1	640		U

Page 2 of		Sit	e Loca	tions - Orga	L_S	<u>edime</u> nt	t Data					
Sample Location ID:	SD-13			SD-11		1	SD-10			SD-09		1
Lab_ID:	42537-6			42562-8			42562-6			42563-5	T	†
Date Sampled:	06/17/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/22/99	Lab	DV
Units:	μg/Kg drywt	Qual.	Qual.	µg/Kg drywt	Qual.	Qual.	µg/Kg drywt	Qual.	Qual.	μg/Kg drywt	Qual.	Qual
Freeze-Dried Sediment %solids:	79.1%			81.3%			78.7%			41.7%		† <i>-</i>
Hexachlorobenzene	330	U	U	330	U	U	340	U	U	640	U	U
Pentachlorophenol	840	U	υJ	810	U	רח	840	U	UJ	1600	<u> </u>	ŪJ
Phenanthrene	2000			7000	D		530		T	760	-	†
Anthracene	330			590			340	u	U	640	U	U
Di-n-butylphthalate	330	U	U	330	U	U	340	U	U	640	U	U
Fluoranthene	4700	`	1	16000	D	T	1500	1	1	2300		1
Pyrene	4100		1	14000	D	1	1300	1	- 	1900	 	
Butylbenzylphthalate	140	J	J	330		U	340		U	640		u
3,3'-Dichlorobenzidine	330	U	U	330	U	U	340	+	Ū	640	+	U
Benzo(a)anthracene	1700	1	1	4000		 	460		T	750		
Chrysene	3000	1		9900	D	7	960		\top	1500		-
bis(2-Ethylhexyl)phthalate	580	_	†	1100			540	_	1	1500	 	†
Di-n-octylphthalate	330	U	U	330	U	U	340	U	U	640		u
Benzo[b]fluoranthene	3800			10000	D		1100		1	1500	1	†
Benzo(k)fluoranthene	2300			5900			910		†	1500		
Benzo(a)pyrene	2600			7200	D		690		1	1100		1
Indeno[1,2,3-cd]pyrene	2200	T		4900			560	,		850		1
Dibenz[a,h]anthracene	530		-	1200			110	 	J	180	 	J
Benzo(g,h,i]perylene	1500	 	1	3700			480	-	- [720	 	†
2-Methylphenol	330	U	U	330		lu -	340	+	lu	640		U
4-Methylphenol	330	U	U	330	Ų	u	340	·	Ū	640	+	U
4-Chloroaniline	330	U	U	330		U	340	· -~-	U	640	 	U
2-Methylnaphthalene	330	U	U	330		- lu	340	+	U	640		U
2,4,5-Trichtorophenol	840	U	U	810		U	840	+	 	1600		u
2-Nitroaniline	840	U	U	810		U	840		U	1600	†	U
3-Nitroaniline	330	U	lu	330	-	Ū	340		U	640	_	U
Dibenzofuran	330	U	Ū	240		J	340	 	υ	640		u
4-Nitroaniline	840	U	- U	810		U	840	 -	U	1600	 	Ü
Carbazole	320	J	TJ	970		 	340	· · · · · · · · · · · · · · · · · · ·	U	640	+	†Ծ—

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Sample Location ID:	SD-08			sD-07	l		SD-06		1	SD-05		
Lab_ID:	42563-7		i	42563-10		!	42563-12			42563-1		
Date Sampled:	06/22/99	Lab	DV	06/23/99	Lab	DV	06/23/99	Lab	DV	06/22/99	Lab	DV
Units:	μg/Kg drywt	Qual.	Qual.	μg/Kg drywt	Qual.	Qual.	µg/Kg drywt	Qual.	Qual.	µg/Kg drywt	-	Qual
Freeze-Dried Sediment %solids:	78.0%			61.1%			87.7%		T	97.3%		
Analyte-Semivolatile Organic Compounds (SVOC)		ĺ										
EPA Method 8270C						1						†
bis(2-Chloroethyl)ether	340	U	Ū	430	U	U	300	U	U	810	IJ	lu
Phenol	120	J	ij	430		u	300		Ū	340	←	<u> </u>
2-Chlorophenol	340	U	Ū	430		u	300	-	lυ	810	_	lu -
1,3-Dichlorobenzene	340	U	U	430	 	i -	300		Ū	810		iu –
1,4-Dichlorobenzene	340	U	υ	430	U	Jυ	300		Ū	810		l <u>u</u>
1,2-Dichlorobenzene	340	U	U	430		U	300		U	810		U
bis(2-chloroisopropyl)ether	340	U	UJ	430		UJ	300		UJ	810	· · · · · · · · · · · · · · · · · · ·	ŪJ
Hexachloroethane	340	U	U	430		U	300	 	U	810		u
N-Nitroso-di-n-propylamine	340		UJ	430		UJ	300		UJ	810		uj
Nitrobenzene	340	U	U	430		U	300		U	810		lu u
Isophorone	340		U	430	+	lυ	300	·	U	810	+	Ιυ υ
2-Nitrophenol	340)	Ū	430	-	U	300		Ū	810		lu
2,4-Dimethylphenol	340	+	Ū	430	-	U	300		Ū	810		Ιυ
bis(2-Chloroethoxy)methane	340	U	Tu -	430		lu	300	+	lu –	810	-	lu
2,4-Dichlorophenol	340	U	Ū	430	U	U	300		U	810	 	u
1,2,4-Trichlorobenzene	340	U	U	430	U	ΰ	300	U	U	810		U
Naphthalene	190	J	J	430	U	U	110	J	J	550		J
Hexachlorobutadiene	340	U	U	430	U	U	300	U	U	810	U	lu
4-Chioro-3-methylphenol	340	U	U	430	U	U	300	υ	u	810		Tu
Hexachlorocyclopentadiene	850	U	UJ	1100	IJ	ŲJ	760	U	UJ	2000	· ·	UJ
2,4,6-Trichlorophenol	340	U	U	430	U	U	300	U	u	810		Ιυ
2-Chloronaphthalene	340	U	U	430	U	U	300	U	U	810		U
Acenaphthylene	340	U	U	430	U	U	80		Ţ <u></u>	810		Ū
Dimethylphthalate	340	U	υ	430	U	U	300	U	U	810		u
2,6-Dinitrotoluene	340	U	Ū	430		U	300		Ū	810		Ū
Acenaphthene	130	J	j	150	_	J	300		Ü	390		J
2,4-Dinitrophenol	850	U	UJ	1100	+	UJ	760		UJ	2000	-	UJ
2,4-Dinitrotoluene	340	U	U	430	U	U	300		U	810		U
4-Nitrophenol	850	U	UJ	1100	U	UJ	760	+	UJ	2000	•	UJ
Fluorene	240	J	J	330	J	J	300	Ų	u	680		J
4-Chlorophenyl-phenylether	340	U	U	430	U	U	300		U	810		u
Diethylphthalate	340	U	U	110	J	J	300		U	810		U
4,6-Dinitro-2-methylphenol	850	U	ÛΊ	1100	U	UJ	760		เกา	2000		UJ
n-Nitrosodiphenylamine	340	U	U	150	·	J	150		Ţ	810		U
4-Bromophenyl-phenylether	340	.U	U	430		U	300		U -	810		U

SITE_Org_s/ its Page 4 of 6 Industri-Plex, W rn, MA
Site Locations - Organ, Jedimer

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ediment Data Sample Location ID: SD-08 SD-07 SD-06 SD-05 Lab_ID: 42563-7 42563-10 42563-12 42563-1 Date Sampled: 06/22/99 DΥ 06/23/99 Lab DΥ 06/23/99 Lab Lab DΛ 06/22/99 Lab DV Qual. Units: µg/Kg drywt Qual. ug/Ka drywt Qual. Qual. pg/Kg drywt | Qual. Qual. Qual Qual. μg/Kg drywt Freeze-Dried Sediment %solids: 78.0% 61.1% 87.7% 97.3% Hexachiorobenzene 340 U 430 U u 300 U ĺυ 810 U Pentachlorophenol 850 U UĴ IJ 1100 U 760 U UJ 2000 U UJ Phenanthrene 2000 4100 1000 5900 Anthracene 220 J 410 J 260 J 640 J Di-n-butylphthalate 340 U 430 U 300 U 810 U U Fluoranthene 3900 8300 D 3400 12000 Pyrene 3000 6500 2600 7900 Butylbenzylphthalate 340 U 430 U 300 U U 810 U U 3,3'-Dichlorobenzidine 340 U 430 U 300 U ū 810 U U Benzo[a]anthracene 1100 2200 1300 3100 Chrysene 2200 4900 1800 6500 bis(2-Ethylhexyl)phthalate 1000 2600 37000 D 3700 Di-n-octylphthalate 340 U 430 U 300 U υ 810 U Benzo(b)fluoranthene 2200 5500 2100 6400 Benzolk]fluoranthene 1800 3400 1700 5600 Benzo(a)pyrene 1400 3000 1400 3700 Indeno[1,2,3-cd]pyrene 1200 2400 940 3100 Dibenz(a,h)anthracene 220 J 470 210 J 670 J Benzo[g,h,i]perylene 940 1700 760 2300 2-Methylphenol 340 U 430 U 300 U 230 J 4-Methylphenol 340 U U 430 U U 300 U u 810 IU 4-Chloroaniline 340 U U 430 U 300 U 810 U 2-Methylnaphthalene 340 U 430 U 300 U 810 U U 2.4.5-Trichlorophenol 850 U 1100 U 760 U 2000 U U 2-Nitroaniline 850 U 1100 U 760 U 2000 U U 3-Nitroaniline 340 U 430 U 300 U U 810 U U Dibenzofuran 150 J 170 J 300 U U 460 J 4-Nitroaniline 850 U 1100 U 760 U U 2000 U U U Carbazole 400 670 160 J 1100

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Sample Location ID:	SD-05DUP		
Lab_ID:	42563-3		
Date Sampled:	06/22/99	Lab	DV
Units:	μg/Kg drywt	Qual.	Qual.
Freeze-Dried Sediment %solids:	55.1%	ı <u>.</u>	
Analyte-Semivolatile Organic Compounds (SVOC)	Field Duplicate		
EPA Method 8270C			
bis(2-Chloroethyl)ether	1900	U	U
Phenol	760	JD	J
2-Chlorophenol	1900	υ	U
1,3-Dichlorobenzene	1900	U	U
1,4-Dichlorobenzene	1900	Ų	U
1,2-Dichlorobenzene	1900	U	U
bis(2-chloroisopropyl)ether	1900	U	UJ
Hexachloroethane	1900	U	U
N-Nitroso-di-n-propylamine	1900	υ	บม
Nitrobenzene	1900	 	U
Isophorone	1900		U
2-Nitrophenol	1900	 	U
2,4-Dimethylphenol	1900	U	U
bis(2-Chloroethoxy)methane	1900	Ū	U
2,4-Dichlorophenol	1900	Ų	υ
1,2,4-Trichlorobenzene	1900	Ū	U
Naphthalene	1100	JD	J
Hexachlorobutadiene	1900	U	U
4-Chloro-3-methylphenol	1900	U	U
Hexachlorocyclopentadiene	4800	υ	ΟJ
2,4,6-Trichlorophenol	1900	U	U
2-Chloronaphthalene	1900	U	U
Acenaphthylene	1900	U	U
Dimethylphthalate	1900	U	U
2,6-Dinitrotoluene	1900	U	U
Acenaphthene	1200	JD	J
2,4-Dinitrophenol	4800	U	ΠĴ
2,4-Dinitrotoluene	1900	U	U
4-Nitrophenol	4800	U	UJ
Fluorene	2000	D	j
4-Chiorophenyi-phenylether	1900	υ	υ
Diethylphthalate	1900	U	U
4,6-Dinitro-2-methylphenol	4800	U	UJ
n-Nitrosodiphenylamine	1900	U	U
4-Bromophenyl-phenylether	1900	U	U

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Sample Location ID:	SD-05DUP		
Lab_ID:	42563-3		
Date Sampled:	06/22/99	Lab	DV
Units:	µg/Kg drywt	Qual.	Qual.
Freeze-Dried Sediment %solids:	55.1%		
Hexachlorobenzene	1900	U	u
Pentachlorophenol	4800		UJ
Phenanthrene	15000	D	J
Anthracene	1800	JD	J
Di-n-butylphthalate	1900	Ū	Ü
Fluoranthene	26000	D	J
Pyrene	19000	D	J
Butylbenzylphthalate	1900	U	u
3,3'-Dichlorobenzidine	1900	U	U
Benzo(a)anthracene	6600	D	J
Chrysene	14000	D	J
bis(2-Ethylhexyl)phthalate	4500	D	
Di-n-octylphthalate	1900	U	U
Benzo[b]fluoranthene	14000	D	J
Benzo[k]fluoranthene	11000	D	J
Benzo(a)pyrene	9300	D	J
Indeno[1,2,3-cd]pyrene	7300	D	J
Dibenz[a,h]anthracene	1500	JD	J
Benzo[g,h,i]perylene	5900	D	J
2-Methylphenol	530	JD	J
4-Methylphenol	1900	U	U
4-Chloroaniline	1900	U	U
2-Methylnaphthalene	1900	υ	υ
2,4,5-Trichlorophenol	4800	U	U
2-Nitroaniline	4800	U	U
3-Nitroaniline	1900	U	U
Dibenzofuran	1200	JD	J
4-Nitroaniline	4800	U	U
Carbazole	3100	D	J

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0 11 2 10					'S FOC	auviis	- Organic S	eaime	int Dati						N
Sample Location ID:	SD-01	<u> </u>	 	SD-02	-	1	SD-03			SD-04		-	SD-12		
Lab_iD	42562-4		 	42562-1	 *, -	 -	42541-1			42537-1	<u> </u>	<u>.</u>	42537-4		
Date Sampled:	06/21/99	Lab	DV	06/21/99	Lab	DV		Lab	DV	06/17/99	Lab	DV	06/17/99	Lab	DV
Units:	ug/Kg drywt	Qual.	Qual.	μg/Kg drywt	Qual.	Qual.	µg/Kg drywt	Qual.	Qual.	µg/Kg drywt	Qual.	Qual.	µg/Kg drywt	Quai.	Qual.
Freeze-dried %solids:	87.0%			92.3%			77.7%			67.0%			B3.6%		
Analyte-Semivolatile Organic Compour	nds (SVOC)	1										Τ.			
EPA Method 8270C	· · · · · · · · · · · · · · · · · · ·	i	<u>.</u>												
bis(2-Chloroethyl)ether	300	U	U	1000	U	U	340	Ü	Ü	400	U	U	320	U	Ü
Phenol	300	u	U	1000	U	U	340	U	U	400	U	U	320	U	U
2-Chiorophenol	300	Ų	U	1000	U	U	340	U	υ	400	บ	U	320	U	U
1,3-Dichlorobenzene	300	U	U	1000	U	Ų	340	U	U	400	บ	U	320	U	U
1,4-Dichlorobenzene	300	Ų	U	1000	U	U	340	U	U	400	U	U	320	U	u
1,2-Dichlorobenzene	300	U	U	1000	U	U	340	U	U	400	U	U	320	U	lu
bis(2-chloroisopropyl)ether	300	U	ΠΊ	1000	U	UJ	340	U	บง	400	U	UJ	320	u	ΛΊ
Hexachloroethane	300	U	U	1000	U	U	340	U	U	400	U	U	320	1	- U
N-Nitroso-di-n-propylamine	300	Ü	UJ	1000	U	רח	340		UJ	400	- —	UJ	320	+=	UJ
Nitrobenzene	300	U	U	1000	U	U	340	U	U	400	+	U	320	+	- u
Isaphorone	300	U	U	1000	+	U	340		ŭ	400	+	u	320		 <u>u</u>
2-Nitrophenol	300	U	u	1000	+	U	340	 -	u	400		u -	320		
2,4-Dimethylphenol	300		Ū	1000		U .	340		U	400		- lu	320		u
bis(2-Chloroethoxy)methane	300		ü	1000	 	U	340		lů .	400	+	U	320	+	-
2,4-Dichlorophenol	300		- Ju	1000	+	u	340	,	U	400		U	320	+	-
1,2,4-Trichlorobenzene	300	+	lu -	1000	+	U	340	 	Ü	400	·	U	320		- `
Naphthalene	300	+	ŭ.	1000		- U	160		1,	110			160		
Hexachlorobutadiene	300	•	t <u>u</u>	1000		U	340		Ü	400		U	320		
4-Chloro-3-methylphenol	300	4	u	1000		Ū	340		U	400		u u	320		l u
Hexachlorocyclopentadiene	760	+	ŪJ	2600	+	ÜJ	850		UJ	990		UJ	790		101 —
2,4,6-Trichlorophenol	300	,	U	1000	+	U	340		111	400	+	u	320		U
2-Chloronaphthalene	300		U	1000		Ū	340		Tu Tu	400		U	320		
Acenaphthylene	150	4. -	J	1000		Ü	390			200	+	 	190		-
Dimethylphthalate	300	:	U	1000		U	340		U	400		u	320	•	- u
2,6-Dinitrotoluene	300	-	Ü	1000		u	340		Ū	400	+	u	320		
Acenaphthene	300		u	1000	-	Ťu –	110		1.	400		- U	81		1.
2,4-Dinitrophenol	760	+	uJ O	2600		nı O	850		UJ	990		UJ	790		lui In
2,4-Dinitrotoluene	300	1	u	1000	·	U	340	÷	U	400	+	U	320		111
4-Nitrophenol	760		01	2600	 -		850		UJ	990		UJ	790		- UJ
Fluorene	300		103	1000		U	210		100	160	+	103	190		103 —
4-Chlorophenyl-phenylether	300		U	1000		U	· · · · · · · · · · · · · · · · · · ·		11	400		11		 	-13
Diethylphthalate	300		T.,	1000	-	-t	340	t	U	 	 -	<u>U</u>	320	 	-
4,6-Dinitro-2-methylphenol	760	 	UJ U	2600		. <u> U</u>	340 850		רח	990		UJ	790		ln n
n-Nitrosodiphenylamine	300		U U	1000			-		_		+	103			
4-Bromophenyl-phenylether	300		u –	+		U	340		U	400		<u> </u>	320		U
Hexachlorobenzene	— 	 		1000		U	340		U	400	+ ~	1	320		- U
Pentachlorophenal	300		<u>U</u>	1000	-	Ü.	340		U	400		_U :	320	+	U
Phenanthrene	760		υJ	2600		- 01	850		IJ	990		ini	790		้กา
Anthracene	850	+	+	1000	+	U	3300	+	 	1600	+		1500		
Di-n-butylphthalate	150		J	1000		U	440		1	320		J	380	<u> </u>	
or new Cylphic larate	300	U	Ų	1000	U	U	340	U	U	400	U	U	320	Ù	U

U-Compound was non-detected. Associated value is the sample-specific reporting limit. J-Result was estimated due to QC exceedance. UJ-Compound was non-detected at estimated rep

REFERENCE_C red.xls
Page 2 of 2

Industri-Plex, W m, MA
Reference Locations - Ora Sedime

.ಆ Sediment Data

Validated 12

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Sample Location ID:	SD-01		T	ISD-02	1	10113	SD-03	Gaille	nt Data	SD-04	<u>.</u>		DD 40		N
Lab ID	42562-4	-	 	42562-1	 	1	42541-1		+	42537-1	 -	 	SD-12	·	
Date Sampled:	06/21/99	Lab	DV	06/21/99	Lab -	ΙDV	 -	Lab	Ιον	06/17/99	ļ. 	1514	42537-4	 -	
Units:		Qual.	Qual.	µg/Kg drywt		Qual.		Qual.	 -	+	Lab	DV	06/17/89	Lab	DV
Freeze-dried %solids:	87.0%	- -	Quar.	92.3%		Qual.	77.7%	- -	Qual.	µg/Kg drywt 67.0%	Qual.	Qual.	µg/Kg drywt 83.6%	Qual.	Qual.
Analyte-Semivolatile Organic Com			 	52.67		<u> </u>	77.178		+	67.076			03.076	-	+
Fluoranthene	1500		<u> </u>	1000	ป่บ	U	6400	D	1	3700		+	3100		+
Pyrene	1700	1	1	1000	Ū	lu	6100		1	3400			2900		
Butylbenzylphthalate	300	U	U	1000	U	U	340	U	U	400	 	- 	320		tu
3,3'-Dichlorabenzidine	300	U	Ų	1000	i U	Ū	340	-	u	400		Ū	320	-	u
Benzo(a)anthracene	640		1	1000	U	U	2100		† -	1500	-	 -	1400		 -
Chrysene	1100			1000	+÷	Ū	4400		 	2600			2100		
bis(2-Ethylhexyl)phthalate	94	J	J	1000	U	Ū	1200			180		1,	100		
Di-π-octylphthalate	300	+	lu	1000		lu	340		U	400		 	320	 -	U
Benzo[b]fluoranthene	920		† -	1000	+	u -	4900		 	3000		 	2100		
Benzo(k)fluoranthene	840	·	1	1000	+	u	3200		+	2200			2000		+
Benzo[a]pyrene	810		1	1000	+	u	3300		†	2100	-	╁	1900		
Indeno[1,2,3-cd]pyrene	530			1000	-	u	2400		 	1800	·	 	1400	 	
Oibenz(a,h)anthracene	110	J	J	1000	+	u	530			350		- 	320		
Benzo[g,h,i]perylene	500		1	1000	+	Ū	1700	-	†	1400		 	1100	 	
2-Methylphenol	300	U	U	1000	-	Ū	340		- u	400		10	320		lu -
4-Methylphenol	190	J	J	1000	u	u	340	-	u	400		u	320	·	- lu
4-Chloroaniline	300	Ü	lu	1000	U	U	340	-	ū	400		u	320		- u
2-Methylnaphthalene	300	Ū	U	1000	U	lu -	93		-	400		u	81	-	- J
2,4,5-Trichlorophenol	760	U	U	2600	+	Ū	850	-	U	990		 <u> </u>	790	<u> </u>	1,
2-Nitroaniline	760	U	U	2600	lu	lu —	850		Ι υ -	990		 	790		
3-Nitroaniline	300	U	U	1000	+	U	340		lu -	400	-	υ –	320		- U
Dibenzofuran	300	+	Ū	1000	+	lu	120	· · · · · · · · · · · · · · · · · · ·	ارًا	120		1J	120		+
4-Nitroaniline	760	U	Ū	2600		Ū	850		U -	990	·	-	790	-	-
Carbazole	300	U	lu	1000		lu -	370		1	220		1.	170		

Sample Location ID:	SD-13	1			SD-11		1	SD-10			SD-09		T
Lab_ID:	42537-6				42562-8	Ţ ·		42562-6			42563-5	 	1
Date Sampled:	06/17/99	Lab	DV	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/22/99	Lab	DV
Units:	μg/Kg drywt	Qual.	Qual.	Qual	µg/Kg drywt	Qual	Qual	µg/Kg drywt	Qual.	Qual.		Qual.	Qual.
Freeze-Dried Sediment %solids:	79.1%			T	81.3%			78.7%	+		41.7%		1
Analyte-Pesticides and PCBs					[_				
EPA Methods 8081A and 8082													†
Alpha-BHC	0.84	U	Ų	Ų	0.81	U	U	0.84	U	U	1.6	U	U
Gamma-BHC	0.84	U	U	U	0.81	U	U	0.84	U	U	1.6	U	Ų
Beta-BHC	0.84	u	U	U	0.81	U	U	0.84	U	U	1.6	↓ <u></u>	u
Delta-BHC	0.84	U	u	U	0.81	U	v	0.84	U	U	1.6		Ū
Heptachlor	0.84	U	υ	U	0.81	U	υ	0.84	U	U	1.6	U	u
Aldrin	0.84	U	U	U	0.81	U	U	0.84	·U	U	1.6	_	lu
Heptachlor Epoxide	0.84	U	U	U	0.81	U	U	0.84	U	U	1.6		U
Gamma Chlordane	0.84	U	U	U	0.81	U	U	0.84	U	u	1.6		U
Alpha Chlordane	0.84	U	u	J	0.81	U	U	0.84	U	U	1.6		lu
Endosulfan I	0.84	Ū	Ų	U	0.81	U	u	0.84	Ü	Ū	1.6	U	U
4,4'-DDE	17		1		0.81	U	U	2.7	 -		1.6	U	U
Dieldrin	0.84	U	U	U	0.81	U	U	0.84	Ų	U	1.6		Ū
Endrin	0.84	U	U	U	0.81	Ü	U "	0.84	U	U	1.6	U	u
4,4'-DDD	22				0.81	U	U	3.2			1.6	u	U
Endosulfan II	0.84	U	U	U	0.81	U	U	0.84	U	U	1.6	u	U
4,4'-DDT	13				0.81	U	U	0.84	U	υ	1.6	U	Ų
Endosulfan Sulfate	0.84	U	U	U	0.81	U	U	0.84	Ū	U	1.6	U	U
Methoxychlor	4.2	U	U	U	4.1	U	U	4.2	U	Ü	8.0	Ū	U
Endrin Ketone	0.84	U	U	U	0.81	U	Ū	0.84	U	U	1.6	U	U
Toxaphene	8.4	U	U	U	8.1	U	U	8.4	U	υ	16		U
					<u> </u>	_	 			<u> </u>			
Aroclor 1016	3.3	U	U	U	3.3	U	U	3.4	U	U	6.4	u	U
Aroclor 1221	3.3	+— U	U	U	3.3		U	3.4		U	6.4		Ū
Aroclor 1232	3.3		U	U	3.3		<u>-</u> U	3.4		U	6.4		U
Aroclor 1242	3.3	 _	U	U	3.3	<u> </u>	U	3.4	 -	Ū	6.4		lu
Aroclor 1248	3.3		υ	U	3.3		u	3.4		u -	6.4		υ –
Aroclor 1254	3.3		U	U -	3.3		U	3.4		Ü	6.4		U
Aroclar 1260	3.3	Ū	U	U	3.3		U.	3.4		Ü	6.4		Ū

Industri-Plex, Woburn, MA Site Locations - Organic Sediment Data

Validated 12/07/99 NEH, Inc.

Sample Location ID:	SD-08	1		SD-07			SD-06	T		SD-05		<u> </u>	SD-05DUP	1	
Lab_ID:	42563-7			42563-10			42563-12		1	42563-1	-	<u> </u>	42563-3	 	†
Date Sampled:	06/22/99 L	ab	DV	06/23/99	Lab	DV	06/23/99	Lab	DV	06/22/99	Lab	DV	06/22/99	Lab	DV
Units:	μg/Kg drywt Q	lual.	Qual.	µg/Kg drywt	Qual.	Qual.	µg/Kg drywt	Qual.	Qual.	µg/Kg drywt	Qual.	Qual.	µg/Kg drywt	Qual.	Qual.
Freeze-Dried Sediment %solids:	78.0%			61.1%			87.7%			97.3%			55.1%	-	
Analyte-Pesticides and PCBs					·							—	Field Duplica		
EPA Methods 8081A and 8082											!				
Alpha-BHC	0.85 U	,	U	1.1	U	U	7.6	U	Ü	2.0	U	υ	1.2	Ū	Ü
Gamma-BHC	0.85 ∪	,	۲	1.1	υ	U	7.6	U	U	2.0	U	U	1.2	!U	tu
Beta-BHC	0.85 U	, -	U	1.1	U	U	7.6	u	U	2.0	U	U	1.2		tu —
Delta-BHC	0.85 U	,	U	1.1	U	U	7.6	U	U	2.0	U	lu	1.2		tu -
Heptachlor	0.85 U	j – –	U	1.1	U	U	7.6	U	U	2.0		Ū	1.2		U
Aldrin	0.85 U		U	1.1	U	U	7.6		U	2.0		U	1.2		u
Heptachlor Epoxide	0.85 ∪	, -	U	1.1	U	U	7.6	Ü	U	2.0	U	U	1.2		tu -
Gamma Chlordane	0.85 U	,	U	1.1	U	U	93	Р	J	2.0	U	lu	1.2		lu
Alpha Chlordane	0.85 U	,	Ü	1.1	Ų	U	92	† -	J	2.0		U	1.2	+	lu -
Endosulfan i	0.85 U	,	U	1.1	U	U	7.6	u	U	2.0	U	U	1.2	+	tu
4,4'-DDE	0.85 U	i	U	1.9	U	U	7.6	U	U	2.0	U	U	1.2		U
Dieldrin	0.85 U	,	J	1.1	T	U	7.6	U	U	2.0	u	U	1.2		U
Endrin	0.85 U	,	J	1.1	U	U	7.6	U	U	2.0	U	U	1.2	U	U
4,4'-DDD	0.85 U	,	Ų	1.1	U	U	22	P	J	2.0	U	lu	1.2	U	tu -
Endosulfan II	0.85 U	J	U	1.1	υ	Ų	7.6	įŪ	U	2.0	U	u		U	U
4,4'-DDT	0.85 U)	U	1.1	U	U	7.6	Ü	U	2.0	U	U	1.2	U	U
Endosulfan Sulfate	0.85 U	,	U	1.1	U	U	7.6	U	U	2.0	U	U	1.2	U	U
Methoxychlor	4.3 U	,	Ü	5.4	U	U	38	u	IJ	10	Ų	Ju	6.0	Ü	tu
Endrin Ketone	0.85 U	ı	U	1.1	Ü	U	7.6	U	U	2.0	U	U	1.2	U	U
Toxaphene	8.5 U)	Ç	11	U	u_	76	U	U	20	U	U	12	U	U
Aroclor 1016	3.4 U		U	4.3	U	U	3.0	U	U	8.1	U	u	4.8	U	U
Aroclor 1221	3.4 U		U	4,3	U	U	3.0	U	U	8.1	U	U	4.8	U	U
Aroclor 1232	3.4 U	ı	U	4.3	U	Ü	3.0	U	U	8.1	U	Ü	4.8	U	U
Aroclor 1242	3.4 U		J	4.3	U	U	3.0	U	U	8.1	U	U	4.8	U	U
Aroclor 1248	3.4 U)	U	4.3	Ų	U	3.0	Ų	U	8.1	U	Įū.	4.8	i.U	U
Aroclor 1254	3.4 U	}	د	4.3	υ	υ	3.0	Ų	U	8.1	U	U	4.8	U	U
Aroclor 1260	3.4 U	,	U	4.3	U	U	3.0	Ų	U	8.1	U	lu	4.8		U

industri-Piex, Woburn, MA Reference Location - Organic Sediment Data

Sample Location ID:	SD-01	-	1	SD-02		1	SD-03			SD-04			SD-12		
Lab_ID:	42562-4			42562-1		 	42541-1			42537-1			42537-4		† ··
Date Sampled:	06/21/99	Lab	DV	06/21/99	Lab	DV	06/18/99	Lab	סל – –	06/17/99	Lab	DV	06/17/99	Lab	DV
Units:	µg/Kg drywt	Qual.	Qual.	µg/Kg drywt	Qual	Qual.	μg/Kg drywt	Qual.	Qual.		Qual.			Qual	Qual.
Freeze-dried %solids:	87.0%			92.3%		i	77.7%		 · · · · ·	67.0%			83.6%		14301.
Analyte-Pesticides and PCBs				<u> </u>										_	
EPA Methods 8081A and 8082												 		-	
Alpha-BHC	0.76	Ų	U	2.6	Ü	Ü	0.85	U	U	0.99	U	U	0.79	U	u
Gamma-BHC	0.76	Ū	U	2.6	U	U	0.85	U	UJ	0.99		U	0.79		u -
Beta-BHC	0.76	U	Ü	2.6	U	U	0.85	U	tu	0.99	U	Ü	0.79		υ
Delta-BHC	0.76	U	U	2.6	U	U	0.85	U	Ū	0.99	-	U	0.79		U
Heptachlor	0.76	U	U	2.6	U	U	0.85	U	U	0.99		U	0.79	-	Ťu -
Aldrin	0.76	Ų	U	2.6	U	U	0.85	U	UJ	0.99	U	U	0.79		u
Heptachlor Epoxide	0.76	U	U	2.6	Ú	u	0.85	U	U	0.99	——	Ü	0.79		
Gamma Chlordane	0.76	U	U	2.6	U	υ	0.85	U	U	0.99		U	0.79		Ū
Alpha Chlordane	23	U	J	2.6	U	U	69	E	J	0.99	1	U	0.79		tu -
Endosulfan I	0.76	U	U	2.6	U	U	0.85	U	U	0.99		U	0.79		U
4,4'-DDE	470	E		13	!		43	Ε		0.99	U	U	0.79		Ū
Dieldrin	0.76	U	U	2.6	U	U	0.85	U	U	0.99	U	υ	0.79	U	lu
Endrin	0.76	U	U	2.6	U	U	0.85	U	UJ	0.99	u	U	0.79	U	U
4,4'-DDD	200	E		25	Р		97	E		27			8.0		† · · · ·
Endosulfan II	0.76		U	2.6	U	U	0.85	U	U	0.99	U	Ü	0.79	U	U
4,4'-DDT	180	E		2.6	U	U	26	1	J	0.99	Ū	U	0.79	U	U
Endosulfan Sulfate	0.76	υ	U	2.6	U	U	0.85	U	U	0.99	U	U	0.79	U	U
Methoxychlor	3.8	U	U	13	U	U	4.2	U	υ	4.9	U	U	4.0		ไบ
Endrin Ketone	0.76	U	U	2.6	U	U	0.85	U	U	0.99	U	U	0.79	U	U
Toxaphene	7.6	J	U	26	U	υ	8.5	U	U	9.9	U	U	7.9	U	lu
									 		 			T	1
Aroclor 1016	3.0	U	U	10.4	U	υ	3.4	U	U	3.9	U	U	3.2	U	U
Aroclor 1221	3.0	U	U	10.4	U	U	3.4	U	Ū	3.9	<u>. </u>	u	3.2		U
Aroclor 1232	3.0	U	U	10.4	U	U	3.4	U	u	3.9	u	U	3.2		Ū
Araclar 1242	3.0	U	U	10.4	υ	Ü	3.4	U	U	3.9	U	U	3.2		U
Aroclar 1248	3.0	U	U	10.4	U	U	3.4	U	Ų	3.9	U	U	3.2	U	U
Arocior 1254	3.0	U	U	10.4	Ų	Ū	3.4	U	U	3.9	U	U	3.2		U
Aroclar 1260	3.0	U	U	10.4	U	U	3.4	U	U	3.9	U	U	3.2	U	U

Industri-Plex Wolburn, MA. Sediments 1999 8260B Data Usability Review

IIIA. Review of Volatile Organic Data

1. Holding Times

Comments:

Holding times and QC association with the samples are reviewed to ensure the accuracy of the reported results. The table on the following page (Table 1a) was completed to document the holding times and QC association.

Review the Volatile Organic Analysis Data Sheet.

Were the holding time requirements (surface waters analyzed within 14 days; and sediments analyzed within 7 and 14 days of sampling, for low-level and high-level preservation) met for each sample Yes. No. If no, list below the affected samples and the number of days outside of holding time.

Action: If the holding times were slightly exceeded, estimate (J and UJ) positive and non-detect results. If the holding times were grossly exceeded (more than twice the allowed holding time), professional judgment should be used to determine the action necessary. Evaluation of screening, undiluted and dilution analyses, if available, should be made to determine the impact of the holding time violation on the data quality (e.g., whether or not positive values are estimated (J) and whether non-detected values should be estimated (UJ) or rejected (R)).

All HTS met
Note: Sample SD-5 and SD-5 Dup analyzed as Low-led
Volatiles on 6/27/99 with some analytes above calibration Pange.
Lubratury then revan SD-5 + SD-5 Dup as High-luce Sough (on 6/29/99)
(methanol preserved) and reported these data as SD-SE+SD-SDUPE
No Actim Required.
Temp 7°C on CoC T) 6/21/99. Samples. didn't get to cool-down from field -> lah (rourier same day). No action affects waters only.
didn't get to cool-down from field -> lah
(courier same day). We astron affects waters
Donly.

Table 1a. Holding Time and Associated QC Table

Sample Matrix: Sediments - 14 Sediments + 1 ms/msb + 1 TB

Sample ID	Date/Time Sampled	Field Blank	Method Blank	LCS	MS/MSD	Date/Time Analyzed	Inst.
5004 (4287-2)	6117A 11:30	TB 6/17	B2062302	@20620301 @20620302	50-03 ms +	6124 01:09	V-2
5D12 (-5)	6/17 13:18		132062102	02062101	50-63med	6/21 21:34	V-2
50-13 (-7)	6 17 15 30		J.	L	1.	6121 22:05	V-2
Trip Blace (-8)	617		B1062902	Q1062901 Q1062902		6/29 21/54	V-1
50-03 (42541-2)	6/18/11/30		B 2061902	02061902		6/19 15:37	V-Z
50-03 ms (42541-2ms)	6/18 12:00					649 15:08	V-Z
5D-03m5D (42541-2m5b)	6118 12:30		V			6/19 16:37	V-2
5D-2 (42562-2)	621		B 2062602	Q2062661 Q2061602		6126 22:10	V-Z
50-01 (-5)	6121					626 22:40	V-2
50-10 (-7)	621					6/26 23/10	V-Z
50-11 (-9)	6/21	<u> </u>	<u> </u>	V		626 23:40	V-Z
SD-5 (42563-2)	6/22		B 2062+02+ B 2062-903	Q20(#10)		6127 19:52+612	a oliga
50-50UP (-4)	6/22		k	<u> </u>		427 2786+612	9 021
50-9 1-6)	6122		B2062702	Q2062701 @2062702		6127 22:56	V-Z
50-8 (-8)	6122		J	ال		6 27 25:26	V-Z
50-7 (-11)	6123		B2062802	Q2062801 G2062862		6/29 03:34	V-2
SD-6 (-13)	623	J	V	J	U_	6129 04:04	V-2
						6	
						493	
							
							
			•				
	<u> </u>			<u></u>			

2. GC/MS Instrument Performance Check

The BFB instrument performance checks (tunes) are reviewed to assess the accuracy and sensitivity of the results relative to instrument performance.

Review the tune summaries for BFB

Were all Method 8260B defined mass calibration and ion abundance criteria met for the BFB analyses? Yes No. If no, list below the tune and affected samples.

Review the raw data for one tune. Did the laboratory obtain the BFB mass spectrum in a straight-forward manner (e.g., average of three scans centered across the BFB peak with background subtraction from a scan within 20 scans prior to the BFB scan)? Yes No. If no, list below the method used to obtain the mass spectrum and the affected samples.

Were all samples analyzed within 12 hours of an acceptable tune? Yes/No. If no, list below the affected samples.

Action: If the mass assignment criteria were not met (e.g., base peak assigned to m/z 96 instead of m/z 95), reject (R) all associated data. If the ion abundance criteria were not met, sound technical judgment should be used in evaluating whether or not the data require estimation (U and UJ) or rejection (R) (e.g., the criteria requirements for the m/z 95/96, 174/175, 174/176 and 176/177 ratios are most important for proper tune while the relative abundances for m/z 50 and 75 are of lesser importance.)

Comments:

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3. Initial Calibration

The initial calibration data are reviewed to determine if the standards were compliant with the method protocols.

Review the Initial Calibration Data Summary. Check and recalculate the RRFs, RRF and %RSD for at least one volatile analyte across the ICAL. Does the RRF and %RSD check back to the raw data? Yes No. Were the RRFs for all analytes in the standard all greater than or equal to 0.05? Yes No

Were at least five concentration levels of each compound analyzed during the initial calibration Yes No Were all calibration standards analyzed within 12 hours of BFB time? Yes No

Was the lowest initial calibration standard at a concentration equivalent to the sample-specific reporting limit (Yes) No

Were retention times for each target analyte stable across the calibration (i.e., minimum drift) (Yes)/ No

Did the initial calibration meet %RSD criteria of \leq 30% for all analytes (surrogates and targets) across the calibration range? Yes (No.)

Did the initial calibrations meet %RSD criteria of ≤ 15% for target analytes and surrogates across the calibration range? Yes No. If no, was a calibration curve used for quantitation of results and was the correlation coefficient for the curve ≥ 0.99? Yes/No. Was the curve forced through the origin? Yes No. If no, list below all the affected samples.

Action: If the %RSD >30% and average RRF ≥0.05, qualify positive and non-detected results as estimated (J and UJ). If the %RSD >30% and average RRF < 0.05 estimate positive results (J) and rejecy non-detected results (R). If the %RSD ≤ 30% and average RRF < 0.05 estimate positive results (J) and reject non-detected results (R). Sound technical judgment should be used in qualification of the data. The results for each sample associated with ICAL should be evaluated to determine if a result reported would be impacted by the mis-calibration.

Comments:

ICAL VOA #2 6/26/99

ICAL Check: Compound Checked Acetes

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Avg. RRF	%RSD
Concentration	5MIL	lonsil	TOMSIL	100000	200 Ms/L			
Response Cpd	7987	11074	39313	73080	126414			
Conc, IS	50m/L	50	50	50	570			
Response IS	68719	64714	63357	60488	55909			
RRF	1.162	0.856	0.620	0.604	0.565		0.761	33.0%

4 1CAL- VOA#1 6/23/49 + VOA#2 6/16, 6/23 + 6/26/99

40A#1 ICAL 6/23/99, Count Std at Zng/L except 1- tectme and

4- VOA

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Methyluc chloids resulted in 90 RSD L 3090 => nunduted Additional Notes: UDA#1 6/23/99 ICAL Continued result uncertain (regains us methylan Chloide which had laust ICAK of 5 mg/L - RLS for Trip Black (only sough associated with this Tom) + MB = 38.2% 90 RSO In Brandhas 15 in Trip Blak (42537-8) has been qualified for Bornemethon of methodise Chloide (UJ). Elimin (UJ), Elimination of high point of Bromon than KAL que 90RSD = 28% => ND OF- no action. VOA# 2 Gliclag ICAL layest standard at 10 mg/L last std at shg/L methylan chloride at 549/L RRF >0.05 50-03 ms0 5D-12+5D-13 results Ch 50-03, 50-03ms to determine of RL property reported. OK-Lab reported offerse Componen at the carried sagh-specific Pl. 6 23 99 1 CAL Elimination of launt 5td at 5 mg/c and 1:4h a lai lunt stal at 5 mg/L oint in ICAL ud little effect - AU RRF = >0.05 ~ 10 RSD 1' twest stil at 5 mg/L cetruco lovest Still at 5 mg/L rempue chlor .. SOOH chedeed to make sine RI properly adjusted Actim: Result for Acetar + methyline children 5004, qualified Methylene phoride later as estimated LUJ+J, respectfuly). nigated; therefore (UJ) see mextpage 6. Continued on next page 12/7/95

Eliminate of law point for

Additional Notes: VOA# 2 6/26/99 ICAL Acotal Lovat std at Suy(L AND 92RSD = 33.0% methylan chloride lunest std. at 5 mg/L AND 50RSD = 71.390 however Cinear cure 11t used (not facel throng zero) with r2=1.00 :. 50-2,50-01, 50-10, 50-11, 50-5, 50-50up, 50-9, 50-8 SD-7 and SD-6 checked to verify RL properly reputil Data verified that the results to Tex two compon reported. Elimination of lowest work point for Archingane 90 RSD = 19.990. Actimi Result for Acethe qualified as estimated 50-plus 50-2, 50-01, 50-10, 50-11, 50-5, 50 504P, 50-9, 50-8,50-7 + 50-6 One to 70 RSD) 3090 Non 1026/99 Acother shown to be linear from 10 mg/c to 200 => Positive results quantitated within this region will be accepted. Non-detector and detects < 10 ppb will be qualified us estimated. (UT+J) 50-2 result 210ppb => Acceptant 50- 1 recent > 10 pps => Accept SD-10 result > 10 ppb => Accepted SD-11 resut > 10 ppb => Accepted SD-5 + SD-SDUP results > 10 ppb=> Accept 5D-9 > 10 ppn > Accept 50-8 > 10 ppb => Accept * 50-6 result < 10 ppb => Acetur quel pred as stimets (3) Note: 10 ppb judged versus on-column amantontume printed application of 5 angu-specific factors. * Elimination of lowest a highest point in Methylun chloral awarded not restrict 9850 to 630% => All results for hithfler chloride -qualified as estimated (UT) - Nor 10/26/94 No Action for methylun childhe since linear course used.

4. Continuing Calibration Check

The continuing calibration data are reviewed to determine if the standards were contractually compliant.

Review the Continuing Calibrations and Summaries. Check and recalculate the RRF and %Difference (%D) for at least one of the target volatile compounds in one of the CCALs. Does the RRF and %D check back to the raw data? Yes No. Were the RRFs for all analytes in the standard all ≥ 0.05? Yes/No

Was a continuing calibration check performed every 12 hours following tuning verification of the instrument? (Yes) No. If no, list below all the affected samples.

Were the target analytes recovered within the expected retention time window based upon the initial calibration (i.e., drift of instrument was acceptable)? Yes No.

Did the continuing calibrations meet 8260B criteria for verification of %D $\leq \pm 25$ %? Yes No. If no, list below the outliers and the affected samples.

Action: If the %D > \pm 25% and the CCAL RRF \geq 0.05, estimate positive and non-detected results (J and UJ) for samples analyzed following this standard for the compound(s) that was outside of calibration. If the RRF <0.05 qualify positive results as estimated (J) and reject (R) non-detected results as unusable.

 Comments:
 V6A * 2 6/27/94 CCPL

 CCAL Check: Standard ID C26/270 2 : Compound Checked Benzer

 Responses
 RRF
 avg. RRF ICAL
 % Difference

 Cpd: 1353375
 24.046
 22.948
 -4.8

 IS: 56283@SD
 30
 30

* Action: Non-detected Branomethre result in Trip Black qualified on estimates (W)

CCAL VOR # 2 6/19/99 Branomethre 90 D = -32.490

+ Action: Non-detected Bromomethine results in 50-03, 50-12 + 60-13-qualified

as estimated (UJ)

CCAL VON#2 6/21/99 Chlwomethan 9, D = 25.690 + Bromomethan 20 0 = -70.9%

* Actin: Non-detected results for Chloromethne + Branomethne in SD-12 and SD-13 qualified as estimated (UT)

continued a next pay

continue on next page

Additional Notes:
CCAL VOA #2 6/28 Chlorenethan 700 = 49.7%;
Vingle chloride 31.9%; Bromo methon 35.8% +
methyler cherida 700=54.69. Again, mcc12
checked versus ICAL Linea Calibration and
gare 90 Drift = +32.98%
Adm: Results in Saugh SD-7, SD-6, SD-5E + SD-5DUPE(
tright luck analyse of SD-5+ SD-5E) qualified as sottmental LJ+UJ)
for chloromethani, Vinglichtwich, Bromomethan and
methylene chlarde.
High level analysis results for chbromethane,
Viny chloride, bromomothane, + methylene chloride
not reported in project dutabase for SD-SE+SDSDPE
Prince I to the Prince of the Olivery
Proj database includes low which level analysis for all vocs
definitive results for VOPS to these samples
definitive results for vols for these samples tal 12/7/99.
Bennen reported from high-level analysis Auc
present in the sample (see pg 11B).
- parameter (see page)

5. Laboratory and Trip Blank Results

Laboratory and trip blank results are reviewed to assess the presence of contaminants, which affect the accuracy and sensitivity of the results. See Table 1a. where the Holding Time and Associated QC Table was completed for the samples within this SDG.

Was a Trip Blank associated with each sampling event for volatiles? Yes (No.) If no, list below affected samples.

TB only due for 6/17 for sediments

Was each sample analysis associated with the appropriate method blank, ie., correct matrix, correct matrix level, same batch? Res. No. If no, list below affected samples. All method Blacks were 59 soil and matrix matrix. TB (not matrix matrix)

Review the reporting forms for each method and trip blank. Were any target compounds in the method blanks detected at concentrations above the Reporting Limit (RL)? Yes No. If yes, were methylene chloride, acetone or 2-butanone the only compounds reported above the RL? Yes No. If yes, was methylene chloride < 2.5 times the RL and 2-butanone and acetone < 5 times the RL? Yes No.

Action: - Blanks should not contain contaminants above the RL except for methylene chloride, acetone and 2-butanone which must not be present above 2.5-5 times the RL (see above). The Blank Action Level is defined as five times the highest level seen in any of the matrix-matched blanks associated with this SDG, except if methylene chloride, acetone or 2-butanone are present, in which case the Blank action is ten times the highest level observed for these compounds in any matrix-matched blank. The following actions should be taken if conditions warrant:

- 1. If the blank is not matrix matched, qualify all sample data, for the contaminant associated with this blank, with BB, TB or EB, as appropriate.
- 2. If the reported result in a sample is below the reporting limit (sample < RL) and if a matrix-matched blank contains a result above the quantitation limit (blank > RL), the result in the sample should be negated (U) and raised to the sample-specific RL for that sample
- 3. If the sample result is between the reporting limit and the blank Action Level (RL < sample < Action Level), the result for the sample is negated (U) at the level found in the sample. Based on the level of contamination suspected in the sample, the reporting limit may be elevated. Professional judgment will be used in assessing the action needed.</p>
- If the sample result is greater than the RL and the blank Action Level, no action is taken.

TB6/17, B1062902, B2061902, B2062602, B2062803, B2062702, B2062802+

Comments: 8 2062302
Blanks evaluated:

B2062302 (see page 2-VOA) for Black Association.

Highest Blank: Action taken: B206 1902 - Methyla Chall at Gusten - Black Actin = Gongley See Pay 6A - + GB - for Black Actions

Sample ID Compound Reported Result Result based on Blank Action

50-03 Mothylae Chlaide 65 74 (vailed to Saigh Spot)

50-12 Mothylae Chlaide 11 7 42 4

50-13 Muthylae Chlaide 5 T 15 14

50-04 Muthylae Chlaide 9 T 34 44

SD-SDUP chiarofam

6- VOA

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ar 1 fall n

Additional Notes:

TB 6/17 was a Dater Trip 2 Dot matrix matched for the Sediments >> Since TB reported estimated results for Acetus (4) and Chloroform (1) at levels between Lab's MDC and The Reporting Limit. Since Several Matrix-matched Method Blake also reported truck well of chirofun, no action to qualify Chloroforn results in the sangin was much bused on the TB results. For Acetime, all dath was qualified with TB" based on This non-matrix matched TB. Hawever, it Should be noted that i) The TB was associated with 6/17/99 suppling event and that no other TByen 6/18, 6/22 + 6/23/99 was taken and 2) That for samples 50-12, 50-13, 50-3, 50-2, 50-11, 50-5, SB-5DUP, SD-9 and SD-8, the high (>5 x RL) of Acetme reported in These samples was probably not related to sumpling error. Sunger 50-01, 50-10, 5D-7 and 5D-6 reported Acetru at relatively In concertations (=5x RU) which may have been related to The Sampling. - VBLKOI BZG1902 -amodiated with South SD:03 reported 6 ug/ky methylan chloide + 1 J ug/ky Chloofen. Action tolen (see pani 6-vol) to qualify/negate mothylan charide resnet in No chlooform reported for single => No Action. - VBLKOI B 206210Z - ASSOCIATI WX SD-12 + SD-13 reports Methylan chirich at 4 Jugley and chloofen at 1 Jugley. Action we for methylen chilaide = 40 47/kg (not corrected for songe dry-weight) - For SD-12 B.A wel = 290 holy - Lab reput '11] methylme charich result regated and well set to Suph specific RL. For SD-13 B.A lad = 148 mg/kg- Labragath 5J=) methylme chloride vesult negative and bud set to Saph specific RL.

- VBLKOI B2062302 Associated with SDO4. nuthaline children 3J, Chlarofan Zuglky. 50-04 90 solids: 13.22% > Sugu Spicific B. A Mecle: 227 mylling and chinofum: 76 mg/kg. Levels reputed in 50-04 & B.A so those value were regated and the level raised to the sagu specific RL(34a)

continued on next page.

- VBLKOL B	26,2602 reputed Cl	Marofem of 1JM	Slky - Sagla	
	· · · · · · · · · · · · · · · · · · ·	11 anociated wil		
did not re	pattchloofen:	> No Action Re	quired.	
- VBLK BZ	62702 reputed	chirofen at 1J	isly, Blak	
Action Leve	el (un corrected)	for samph day u	iciapht) is 5 mg	IK.
Snyle 50	0-5 90 solido = 1	10.98% >> B.A La	el= 46 mg/m. L	n6
reported	I Jugik => Bond	in Bluk Adim, t	mchloofom	
		1 De luck Talse	d to the sage	
L L	L for Chlorofon			
		1.99 % 3B. A frd		7 -
<i>K</i>	<i>)</i> .	hloofor result a	egat I and hel	
	some spedfic			
	_	issociated with this	Blut Did not	
report ch	4			
		Mrofum at 1J		
and the second s		- AssociaTI with the		
takn.	POSITIVE YESIMI	3 for chlosform 1	Sware 110 action	
· ·	20/2803 - Madium	-lad Soil Black we	12-05- Fl 48	
		-5 and 50-50 mg		
		1 Berzon over		
, , , , , , , , , , , , , , , , , , ,		- Wel analyses		/\
		Bonza. Chilaro		
		50-SE and 50	,	_
ducto Bluk	tetins (Do not a	uppear in Dath Bu	- Preported you	evel
Sample 1D	Compand	uppen in Dath Bu Reputed Result	Every Board on t	SI-K Action
SD-SE	790 Juan 1011			$\widetilde{\mathcal{O}_{\mathcal{V}}}$
- -	chloofem	790JB	1300 U	A CONTRACTOR OF THE PROPERTY O
		70	1400 U	12/1/99
SD-SOUPE	chloroform	780 JB	17000	171

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Surrogate Spike Recoveries

The surrogate spike recoveries are reviewed to assess the accuracy of the results relative to laboratory performance and specific sample matrix.

Review the Surrogate Recovery information for each field and quality control sample. For one sample, verify that the recoveries reported correspond to the raw data and that the recovery calculation was done properly. Were the recovery data reported properly (Yes) No.

Were the surrogate recoveries within QAPP defined and method-generated accuracy limits? Yes No. If no, were the affected samples reanalyzed? Yes No. List below the affected samples.

Action - If one volatile surrogate recovery exceeds the upper limit, estimate (J) positive due to a potential high bias of the results; no action is required for non-detect results. If one volatile surrogate recovery is below the lower accuracy limit but above 10% recovery, estimate (J and UJ) the positive and non-detect results due to a potential low bias in the results. If any surrogate recovery is below 10%, reject (R) non-detect results and estimate positive results (J) due to potential false negatives and low bias in the results, respectively.. List below the affected samples and required actions.

Comments:

Lab used Dibronoflynomethys Surposet, on a replacent for
1,2-Dichtroethone -du as written in OAPP (OK per method 8760B).
- 50-13 4-Bromofluorobenzus 90Rcc= 72% (according to novertice, sugu
was re-randy and still had BFB (criteria). Lab's critera for BFB
acceptuace was 76-12090 (QAPP criteria = 59-11390). Even that QAPP
criteria mt, 82603 criteria that lab establish acceptance limits
requires that action be bused on labs limits -
* Actim: Results for SD-13 have been qualified as estimated (J+UJ)
due to las surrout recovery. Potential low bias.
-50-5 Dibranoflacranthe Sales = 14990 (high atide)
SD-5 Dup Dibunfhoronuthin 9. Rec= 14690 (high outside)
* Actim: Results (positive) for 50-3 + 50-504P have ben qualified
as estimated LJI. No actim them on non-detected results.
- 50-5E (medium-luck mathenol extractan)-2 lub defind surrogetts luv (>1090). The method surrogates were all within arteria. No
low (>10%). The method surrogates were all within afferia. No
actin true bused in this finding Ind mand no action got
Bungene reported from medium-level (However, New Environmental Horizons, Inc. helmann sentel J" for Alexander Do to the Dota Leviced) Sul (12/76
kenneme secult 5" for all to me in Duta Leviced) Sul (12/76

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recovery and Precision

The matrix spike/matrix spike duplicate (MS/MSD) recoveries are reviewed to assess the accuracy of the results relative to the specific sample matrix and the relative percent differences (RPDs) are reviewed to assess the precision of the results relative to the specific sample matrix.

Review the unspiked sample, Matrix Spike, and Matrix Spike Duplicate (MS/MSD) raw data and recovery results. Were the recoveries for the MS/MSD calculated properly? (Yes) No.

Did the laboratory perform MS/MSDs for each matrix and matrix level analyzed for each analytical batch prepared for analysis? Yes No. If no, list below the affected samples.

Were the MS/MSD recoveries and precision within QAPP and method-generated accuracy limits? Yes / No. Were the RPDs between the MS/MSD within the QAPP precision criteria? Yes No. If no, list below the affected compounds.

Was the %RSD for non-spiked compounds in the unspiked sample, MS and MSD ≤ 50%? Yes / No NA

Action: No action is taken to the entire data set based on MS/MSD results alone. The unspiked sample may be qualified based on MS/MSD results as follows: if the MS/MSD recoveries were greater than the upper accuracy limit, estimate (J) positive results due to potential high bias; no action is required for non-detect results; if the MS/MSD recoveries were below the lower accuracy limit but above 10%, estimate (J and UJ) positive and non-detect results due to potential low bias; if a MS/MSD compound was recovered below 10%, estimate (J) positive results due to potential low bias and evaluate the non-detected results to determine whether estimation (UJ) or rejection (R) of the unspiked sample data is warranted. If the RPD between the MS and MSD > QAPP criteria, estimate (J and UJ) positive and non-detected results in the unspiked sample. If the %RSD, for a non-spiked compound, between the unspiked sample, MS, and MSD >50%, estimate (J) positive results and use professional judgement to qualify other detected and non-detected analytes.

Comments:

	> 109s. All	RPDs between	ms Imad	accep
Non-spik comp	ments			
50-03	5D-03 ms	50.03 ms D_	90 RSD	
210 moley	160,49114	Ht 250 mg/m	22%	OK.
60 mg/m (>21	(84) ND (84)	54 49/kg (>2	xel) 8790	-
		·	· 	····

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Laboratory Control Sample and Standard Reference Material Analysis

The Laboratory Control Samples (LCS) and/or Standard Reference Material (SRM) are reviewed to assess the accuracy of the results relative to the analytical procedure.

Review the raw data and recovery information for the LCS/SRM.

Did the laboratory perform a LCS or SRM for each matrix and matrix level analyzed? (Yes \(\infty \)No. If no, list below the affected samples.

Were the LCS or SRM recoveries within QAPP and method-generated accuracy requirements for recovery? Yes //No.) If no, list below the affected compounds.

Action: If the LCS or SRM recoveries are above criteria, estimate (J) positive results due to potential high bias, no qualification of non-detected results is necessary. If the LCS or SRM recoveries are between 10% and the lower recovery limit, estimate (J and UJ) positive and non-detect results for the samples associated with the analytical batch due to potential low bias in the results. If the recovery in the LCS or SRM is less than 10%, estimate (J) positive results due to low bias and reject (R) non-detect results due to potential false negatives.

See page 2-10A where LCS reference to Saylor given

Comments:

Q20626D1 + Q2062602 -014 01069201 + 0106902 -OK Q 2062 701+ Q2062702 -OK Q 2062101 + Q2062102 TOK Q 2062801+ Q2062802 -06 Q2061901 + Q2061902 -0K

Q2062301 + Q2062302 - 1,1-Dichlosether and Wichlosether in both LCS + LCSD high attich without - This with 50-04 mb => Since 2 out a 5 LCS/LCSD 50-04 as estimated (5) - No action required for non-detects (suga so-ou did not report positive results once blank action taken - spe page 6-VOA) then fore - no action taken. Potential high bear in estimated results. for 12/7/29

No results qualified because the two defected results for shethylene chloride + chloroform have been negated dhe to blank actions;

9. Internal Standards

The Internal Standard (IS) response in the samples and standards is evaluated to ensure that the analytical system was in control during analysis.

Were the IS areas for each sample and standard analyzed within -50 to + 100% of the continuing calibration? Yes No. Were the retention times for the IS within ± 30 seconds from the retention time established in the continuing calibration? Yes No.

Action: If an IS area is greater than +100% compared to the continuing calibration, qualify positive results as estimated (J), non-detects do not require action. If the IS area is below -50% but not lower than -80%, estimate positive and non-detected results (U and UJ). If the area drop off or retention time shift for the IS is too severe (>-80%), non-detected results may require rejection (R). Professional judgment must be used in evaluating the data associated with poor IS performance.

Comments:

Lab Spilled 4 Internal Standards for Analysis - Last IS=1,4.Dichlarobengen-dy which is used to quantify Dichlarobengues, ctc. that

are related "non-volatile" volutile - Lab calibrated the Systems

using standards that contained more unalyte than the after veguind

for vegeting for these sungle.

- For Sungle SO12 + SD-13 + SD-5 + SD-7 + SD & - This last Is

was <-50% congared to CCAL IS but all wee >-80%. Since the

IS was not used to quantitate any of the analyte reported, no action was taken

- For Sungle SD-6, IS Chirobenzene - Ds week <-50% but >-80%.

Pactim: The results for Chirobenzene, Ethyl benzee, Yylmes, Styrene,

Bromoform + 1,1,2,2-Tetrachlaroethane have been qualified as

lotimated (UI) since the amociated Is for then analyte was

recovered below criteria in Sungle SD-6.

10. Sample Quantitation Limits

Review raw data and reporting forms. Did the sample-specific RLs meet the QAPP criteria? Yes/No. Did the laboratory accurately adjust sample reporting limits to account for sample specific preparation and analysis conditions? (Yes) No.

Were all components reported in the samples quantitated within the calibration region of the instrument for the detected analytes? Yeal No Were the relative retention times for all components reported within the retention time windows established during initial calibration Yes/No

If the sample analyses were performed at dilutions, were more concentrated analyses performed or was sample screening information included in the data package? (Yes) No.

Were sample dilutions appropriate relative to scaling of the chromatograms and the calibration levels employed (e.g., peaks of interest within upper half of the chromatogram and quantitation done within the calibration range)? Yes / No.

Action - If the quantitation limits for non-detect results are lower than the lowest calibration standard, or if a positive result is detected outside of the calibration range, estimate positive and non-detected results (J and UJ).

Given in the OAPP due to the low To solido content of the Sediments (OAPP indicates RLs around 100% solido and world be affected by actual surger To solido). In addition, the lavest ICAL Standard for all conforms but Methyline Chlorida, Acetra, Branoform, Chloroform, Tolume & Carbon Tetradolisida for some ICAL was above the 2 mg/s requested standard land was actually at 5 mg/s I see pages 44-VOA + 45 VOA). All PLS correctly reported duter vising the appropriate lowest ICAL Std and correctly mad the simple-specific wellyhts + To solido.

Sample 50-5 + 50-5 Dur Reported results for Acetra and Rangemen which were above the calibration rungs for the low-luck volatiles analogies. The laboratory reveal of the Sol-5 Dur as medium-luck sediments (analogied methodol extract) and reported

Continued in mext 11-VOA pay.

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results for These median-tech another using on "E" suffix on the super IDS. A compaish of the Benzen results In SD-5 & SD-5E and SD-5Dar with SD-5Dar give recommoble comparability (i.e. 50-5 + 50-5 Dup results were love than SD-SE+ SD-SBUPE as one night expect if The analysis were over saturated and The "E" date were the same under of magnitude as the law-local and si). * Thurspace, the Benzin result from the SD-SE + SD-SDUPE has been associated with the 50-5 + 50-5048 Results in the project databan - See pay 11B-1101 for Calculation The Acetus data; however, between SD-5 + SD-SE and SD-SDUP + SD-SDUPE are not comparable: SD-5 SD-SE SD-5DUPE Acom 2400 mg/m 49000 mg/m 2100 mg/m 20000 mg/m

There was no Methanal Trip Black Associated with them medium-tuck sedimets. The method medium-well method Bluk did not report Aceta. Bused on profusional judgment, using the medium-well Aceture results to associate with the field samples is not appropriate. The original Acetre results from the law-liel annelyses were reported 4090 above The colibration canno (i.e. higher standard at 200 mg/L and raw acetre date the sage was 276 mg/L and 264 mg/L). Therefore, the Acetre date reported for the Tan-luck analysis there been accepted in reported; hower, I these dute have been qualified is estimated (J) due to quantitation apre the calibration range of The instructs.

in samples SD-05 and SD-05. DUP

DC 12/7/99

Additional Notes: Lab Reported SD-5E + SD-SDUPE date wing the
amount of mathematical aresentative us being exceed to the extract with
the same that the state of the same state of the
thereway, since the singles contried I'm 70 solich.
5D-5E Benza
Lub Reporting - 100 pl of 2500 pul Extract analyzed. Sorgh was 16.9 g of 10.9 8 90 501: do Songle -5 ml Purp Response Banza = 1018563 IS Pap = 55180 @ 50 mg/1. RRF Benza = 22.946
was 16.9 g of 10.918 90 solids sample -5 ml Purg
Response Benzer = 1018563 IS lesp = 55180 @ 5049/1
RRF Benzum = 22.948
Conc = 1018563 x 50 x 25000 x 5 = 27093Mg/kg / 55180 x 22.948 100 (16.9 x 1098)
55180 × 22.948 100 (16.9 × .1048)
Using Sanger water as also being party the extract-
16.9a x (1-0.1098) = 15.04ml
Using Sough water as also being party the extract- 16.9g x (1-0.1098) = 15.04ml Title Extract = 2500gue most + 15040pe water = 40040
Re-calc.
S5180 x 22.948 100 (16.9 x.1098) = 4300mg/m
55180 x 22.948 1070 (16.9 × .1048)
= 43000mg/kg
50-5400PE Que - 185- 1999 Scalid Sad - 50-4-11/162
50-5\$DUPE Benzur - 18.59 of 9.99 % 501:ds Sught => Water = 1665zace .: Total Volum Extract = 25000pul + 1665zul = 4165zul
10 1 10 10 10 10 10 10 10 10 10 10 10 1
Result.
Benzue Conc = Report Conc. × 41652
$= 28779 \times \frac{41652}{25000} = 47948 \mu g/h$
2500U
=48000 mg/kg
For the Burger results for SD-5 and SD-5DUP, The values
13000 mg/ly and 48000 mg/ky, respectedly, will be associated
with these sampler.

11. Field Duplicate Precision

Comments:

Field duplicate samples are reviewed to assess representativeness of the sample aliquot to the area sampled and the precision of the results relative to field sampling techniques.

Review analytical results for the duplicate sample analyses.

Action: If field duplicate precision exceeded 30% RPD for aqueous samples or 50% RPD for sediment samples for any compound, estimate (J and UJ) positive and non-detect results for the affected compounds in both samples. If severe imprecision was noted in the field duplicate sample (i.e., RPD >100%), qualify the remainder of the associated field sample data based on sound technical judgment.

Field Duplicate Samples: _50 - 5	SD-5 DUP
•	where FD precision between detected.
	showing RPD >5090, the results
have benn qualified SD-5Dup singles	as estimated (J) for The SD-5 and
0	
In gomene, field met for the Volatil	duplicate precision objectives were not
	V U

	SD-5 42563-2	SD-5 Sample Result	SD-5DUP 42563-4	SD-5DUP Sample Result		
Analyte	μg/Kg	RL = 18 ug/kg	μ g/Kg	RL = 16 ug/kg	RPD	Action
Vinyl chloride	17	<rl< td=""><td>ND</td><td></td><td>NA</td><td>No Action</td></rl<>	ND		NA	No Action
Acetone	2400	>2xRL	2100	>2xRL	13.3	No Action
Carbon disulfide	63	>2 x RL	56	>2xRL	11.8	No Action
2-Butanone (MEK)	540	>2 x RL	490	>2xRL	9.7	No Action
cis-1,2-Dichloroethene	54	>2xRL	17	>RL but <2 x RL	104.2	J Both
Benzene	43000	>2xRL	48000	>2×RL	11.0	No Action
Trichloroethene	22	>RL but <2 x RL	10	< RL	75.0	J SD-5
Toluene	140	>2xRL	45	>2 x RL	102.7	J Both
Chlorobenzene	37	> 2 x RL	15	< RL	84.6	J SD-5
Ethylbenzene	710	>2 x RL	280	>2xRL	86.9	J Both
p/m-Xylene	3400	> 2 x RL	1400	>2 x RL	83.3	J Both
o-Xylene	370	>2 x RL	220	>2xRL	50.8	J Both

12. Additional QA/QC Issues

Were the percent solids for the samples >30%. Yes (No) NA.

The sampling for volatile sediment samples was modified from Method 5035 in an attempt to appropriately deal with sediments with very low solids content (<30%). As such, the low-level preservation technique required sampling approximately 5g of sediment and placing the sample under 5mL of water (method 5035 suggests a 1:2 ratio of soil to water). The medium- or high-level preservation technique also required 1:1 methanol to sample preservation. Therefore, while Region I data validation guidelines require that data be estimated (J) and/or rejected (R) based on low %solids content of the samples, no action was taken to qualify sediment sample results based on solids content for this project.

List any additional issues which may affect the quality of the results. List the affected samples, QA/QC issue, and necessary actions taken in the comments section below.

All sough had 90 solds 23090 - 90 solich membed ware:

Sungh 10	90 Solids	Sugar 10	90 Solide
5004	13.22	50711	14.68
SDIZ	13.76	5b-5	10.98
5013	27.04	SD-S Due	9,94
S D +3	23.74	30-9	7.19
50-2	8.79	SD-8	17.04
50-01	23.8	50-7	10.29
SD-10	22.43	50-6	18.36

No Action taken except to note 90 solicls.

- Dute of Collection incorrect in Dutbone for swand sugla.

The correct page date was added to the DB file during this evaluation.

IVA. Example Sample Calculations

Review of one sample per data package is performed to determine if sample results and quantitation limits were correctly calculated and reported.

Sample ID: 50-5 was selected for review in this data package.

A. Form 1 Review

- 1. Were the Form 1s for completed according to the method/QAPP requirements? Yes No. If no, list below the affected fields.
- 2. Reproduce the reporting limit for VOC in one of the samples, did the laboratory correctly calculate the quantitation limits? (Yes) No. If no, list below.
- B. Quantitation Review $2 \frac{8}{(5.2 \times .1098)} \times 1 = 18 \frac{1}{15}$

Reproduce a calculation for one volatile analyte in one of the samples that contained a positive result and compare the calculated result to the result reported by the laboratory.

Analyte Checked: Ethyl benzene

Laboratory Result: 710 A51k Calculated Result: 710 A51k

Ethylburgane Response = 1625108 IS Besp = 526045@50Ag/L

RRF 1CAL = 1.931

Conc = 1625108 x 50 x 5 = 700.5 M9/kg 526045 x 1.931 (5.2 x 0.1098)

Actual weight, per Vine Log, was 5.15g - 5.2g on Faml.

using 5.159 glum

Cmc = 707,340/1 = 710 mg/m

lab used actual weights, not randed value as shown as

Frm 1s.

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IIIB. Review of Semivolatile Organic Data

1. Holding Times

Holding times and QC association with the samples are reviewed to ensure the accuracy of the reported results. The table on the following page (Table 1a) was completed to document the holding times and QC association.

Review the Semivolatile Organic Analysis Data Sheet.

Were the holding time requirements (surface waters extracted within 7 days; sediment and biota extracted within 14 days of sampling (or of thawing for biota) and extracts analyzed within 40 days of preparation) met for each sample? Yes No. If no, list below the affected samples and the number of days outside of holding time.

Action: If the holding times were slightly exceeded, estimate (J and UJ) positive and non-detect results. If the holding times were grossly exceeded (more than twice the allowed holding time), professional judgment should be used to determine the action necessary. Evaluation of screening, undiluted and dilution analyses, if available, should be made to determine the impact of the holding time violation on the data quality (e.g., whether or not positive values are estimated (J) and whether non-detected values should be estimated (UJ) or rejected (R)).

Comments:								
Sample 4	une ve	eved at	WHGEL	and the	- Ship	ped to :	Subcontrac Wied Sa Regulad.	b ~
An free	ze-dr	ym.	Lab es	Anted	all f	reze-d	wied sa	-pli
within 14	day	1 3a	an call	etm.	No F	totin 1	Regulad.	
	1	}	0				\	
				· -				_
<u> </u>	ales	Levive	d 6/2	199	Coc	Temo=	プ℃、	_
No A	ction	- see	06	1-100				
		•	H					_
								-
								_
								-

Table 1a. Holding Time and Associated QC Table

Sample Matrix: 14 Sediments + 1 ms (msD

Sample ID	Date/Time Sampled	Field Blank	Method Blank	LCS	Date/Time Extracted	Date/Time Analyzed
5004 (42537-1)	6/17/94 11:30	RBGHT	MSOTOLB L	MOTOIL3	7/01/99	715
SD12 (-4)	6/17 13:18		<u> </u>			3/15
50-13 (-6)	6117 15:30	<u> </u>	ļ			715
50-03 (42541-1)	6/18 11:30	RBGHE	<u> </u>			7/16
50-03ms (-1ms)	6/18 12:00	†	ļ.,			71.6
50-03msb (-1msa)	6 18 12:30	<u> </u>	<u> </u>	J	¥	7/16
RB 6/17 (42547-2)	6/17 11:00	NIA	SW0623BL		47/03/123	7108/14
RB 6 18 (42551-3)	6/18 14:30	NIU	520623B1	<u> </u>		7109/99
SD-2 (42562-1)	621	RB6121	MS07018 1	msotous	710194	715
50-01 (-4)	6 21		1			3/15
50-10 (6)	621					3/15
D-11 (-8)	6 21	<u> </u>	<u> </u>	با	¥()==(=	7/15+7/16
	6 21	NA	5W0628B1	SWOGZE LI	34 16 1 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2100109
50-5 (42563-1)	-	RB 6/22	msofolb (msofole3	7101199	715
SD-504P (42563-3)	6/22			1		3115
50-9 (-5)	6/22				 	715
50-8 (-7)	6122	V			 	3/15
50-7 (-10)	6123	R\$ 6/23				7/15 +7/16
5D-6 (-12)	6123	<u> </u>	J.	<u></u>		715 +716
F - '	422	NIA	5006288)	5W06284	6/28/99	7109199
RB 6/23 (-14)	6123	NA	<u> </u>	با با	<u> </u>	3/09/91
					<u> </u>	
					·	
		! 		<u> </u>		

^{*} RB Data submitted with Surface Water State

2. GC/MS Instrument Performance Check

The DFTPP instrument performance checks (tunes) are reviewed to assess the accuracy and sensitivity of the results relative to instrument performance.

Review the time summaries for DFTPP

Were all Method 8270C defined mass calibration and ion abundance criteria met for the DFTPP analyses? (Yes) No. If no, list below the tune and affected samples.

Review the raw data for one tune. Did the laboratory obtain the DFTPP mass spectrum in a straightforward manner (e.g., average of three scans centered across the DFTPP peak with background subtraction from a scan within 20 scans prior to the DFTPP scan)? Yes No. If no, list below the method used to obtain the mass spectrum and the affected samples.

Were all samples analyzed within 12 hours of an acceptable tune? Yes No If no, list below the affected samples.

Action: If the mass assignment criteria were not met (e.g., base peak assigned to m/z 199 instead of m/z 198), reject (R) all associated data. If the ion abundance criteria were not met, sound technical judgment should be used in evaluating whether or not the data require estimation (U and UJ) or rejection (R) (e.g., the criteria requirements for the m/z 198/199 and 442/443 ratios and relative abundances of m/z 68, 70, 197, and 441 are most important for proper tune while the relative abundances for m/z 51, 127 and 275 are of lesser importance.)

Comments:

Form 5's for DFTPP Summing show latest CLP sow Time Criteria.
Lab Instruct Summany correctly reports 8270c criteria. All
Ima mt 8270c criteria
Sough SD-03 run 7/16/90 was 33 min outsided The time
(ie., 12 yres 33 min since them). The Sough was revum at dilution
(DF=2) on Aluga within Time Time. Results von comparable to 5003
ariginal DF=1 andpis => No action take hand on injection attic
of 12 HR Time.
0

4. Initial Calibration

The initial calibration data are reviewed to determine if the standards were compliant with the method protocols.

Review the Initial Calibration Data Summary. Check and recalculate the RRFs, RRF and %RSD for at least one polynuclear aromatic hydrocarbon (PAH) analyte across the ICAL. Does the RRF and %RSD check back to the raw data? Yes No. Were the RRFs for all analytes in the standard all greater than or equal to 0.05 Yes No.

Were at least five concentration levels of each compound analyzed during the initial calibration Yes No Were all calibration standards analyzed within 12 hours of DFTPP tune? Yes / No

Was the lowest initial calibration standard at a concentration equivalent to the sample-specific reporting limit? Yes (No) - See $\rho a_N + \rho - Svoc$

Were retention times for each target analyte stable across the calibration (i.e., minimum drift) (Yes) No

Did the initial calibration meet %RSD criteria of \leq 30% for all analytes (surrogates and targets) across the calibration range? Yes (No.)

Did the initial calibrations meet %RSD criteria of \leq 15% for target analytes and surrogates across the calibration range? Yes /No. If no, was a calibration curve used for quantitation of results and was the correlation coefficient for the curve \geq 0.99? Yes No. Was the curve forced through the origin? Yes / No. If no, list below all the affected samples.

Action: If the %RSD >30% and average RRF \geq 0.05, qualify positive and non-detected results as estimated (J and UJ). If the %RSD >30% and average RRF < 0.05 estimate positive results (J) and rejecy non-detected results (R). If the %RSD \leq 30% and average RRF < 0.05 estimate positive results (J) and reject non-detected results (R). Sound technical judgment should be used in qualification of the data. The results for each sample associated with ICAL should be evaluated to determine if a result reported would be impacted by the mis-calibration.

Comments:

ICAL Check: Compound Checked Chrysen

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Avg. RRF	%RSD
Concentration	2,mg/ml	549/mL	10 ms/nc	15 mb hac	20uglan	4049/21		
Response Cpd	675732	1749514	3241353	5056696	7851190	11905835		
Conc, IS	10 mg/mL	ı	10	10	10	10		
Response IS	2776696	2888156	2666879	2814312	2703904	2516400		in the said
RRF	1,217	1.2115	1.215	1.198	1,452	1.183	1.246	8.2

	Additional Notes:
	Hoxachirocyclopentudiene laust ICAC standard was at 5 mg/ml
	which is equivalent to 670 mg/km (dry weight) - OAPP Requested 170 mg/km.
	is law Reported Hexachtroeydopentudine as if the last
	ICAL were at 2 molar instead of sugland. Also, lab's RLs for
	2 - Nitroaniline was based on land 1 CAL of Saylone;
	haven, lab did me 2 mg/me as larest standard and
	QAPP requested 3- Wheavilore be reported down to Zashie.
ř	Action: A'll donte for Hexachbrocycloperatedience Raised to Currect RL and 3-Nitopanilae Lowered to Correct RL.
	Currect RL and 3-Nitrounilae Lowered to Correct RL.
	- Horachlerocyclopentadiene 90 RSD = 33.010
	-2,4-Dintrophinal 90RSD = 72.2%
	4, 6-Dinitro-2-methyl phonol 90 RSD = 36,190
	All ah and the grant the
	All other analyte 90RSD C 3050.
¥	Actim: Results for Hexachloogyclopentadies, 2,4-Dinitrophonol
	and 4.6-Divito-2 nethylphonal qualified as estimated
	(IT UI) in all South These three compands were all non-detected
	In the Sarch in this 50th. Also, is all three comends the
	oriman pource & non-linearity Own in the lovest collibration
	for the South in this 50th. Also, for all three compands the primum source of non-linearity was in the lowest collibration standard (i.e. less containty in the RL).
	Δ

5. Continuing Calibration Check

The continuing calibration data are reviewed to determine if the standards were contractually compliant.

Review the Continuing Calibrations and Summaries. Check and recalculate the RRF and %Difference (%D) for at least one of the PAH in one of the CCALs. Does the RRF and %D check back to the raw data? Yes No. Were the RRFs for all analytes in the standard all ≥ 0.057 Yes No

Was a continuing calibration check performed every 12 hours following tuning verification of the instrument? (Yes No. If no, list below all the affected samples.

Were the target analytes recovered within the expected retention time window based upon the initial calibration (i.e., drift of instrument was acceptable)? Yes No.

Did the continuing calibrations meet 8270C criteria for verification of %D $\leq \pm 25$ %? Yes No. If no, list below the outliers and the affected samples.

Action: If the %D > \pm 25% and the CCAL RRF \geq 0.05, estimate positive and non-detected results (J and UJ) for samples analyzed following this standard for the compound(s) that was outside of calibration. If the RRF <0.05, qualify positive results as estimated (J) and reject (R) non-detected results as unusable.

 Comments:

 CCAL This 194

 CCAL Check: Standard ID COTISOI. D : Compound Checked Fluments

 Responses
 RRF
 avg. RRF ICAL
 % Difference

 Cpd: 3830719
 1.265
 1.338
 5.4

 IS: 30224443
 3
 5.4

CCAL 7/9/99 (RBS) - OK except 2.4-Dinitrophenol 900 = 25.6 % - No Action taken

for Surgh Duta

- CCAL 7/15/99 Bis(2-chloroisopropylether 900 = 45.7%; N-Nitrosa-di-n-propyl
amine 500 = 27.5%; Hexachloroxyclopentadine 500 = 34.9%, 4-Nitrophenol

900 = -45.9% * Action: All results for 4 congands listed above
in all surgh analyzed in 7/15/99 (see page 2-5voc) have been quelified
as estimated (To U) as appropriate). Level of detection uncertain due to

CCAL 7/16/19 (Secondar distution Runs for Suph) - Bis(2-chlorothy) etherized

27.4% 0; Bis(2-chloroisopropylether - 51.0% 0); N-Nitroso-dimental animals

d:-n-propylamice 27.6% 0; Hexachlorobutadine -25.9% 0;

5-SVOC

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Additional Notes:
2,4-Din:taphenal -48,5900; 4-Nitrophenol -56.3%D.
The sample analyzed following this CCAL work
SD-03E SD-03mls, SD-03msd, SD-11E, SD-7E+
50-68 where the "E" suffix denotes a secondary
diluten analysis for the saign since the original
analyse repulted currin throats above colibration
range There secondary diluteral analyse will only
be bused to report Analyth Results which were
above range on the arginal run (e.g. 50-03, Fluoanth
was above vany in the DE=1 run; and in SD-03E(DE=2)
Fluxunther who in range so this reported value will
be ansociated with Flaganthe 12 50-03).
Since none of the Dilution analyse will be used to reput
date for the CCAL compands with 101 > = 25%, no
action was taken bessel on the CCAL of 7/16/99.

5. Laboratory and Field Blank Results

Laboratory and field blank results are reviewed to assess the presence of contaminants, which affect the accuracy and sensitivity of the results. See Table 1a. where the Holding Time and Associated QC Table was completed for the samples within this SDG.

Was each sample analysis associated with the appropriate method blank, ie., correct matrix, correct matrix level, same extraction batch? Yes No. If no, list below affected samples.

Review the reporting forms for each method and field blank. Were any target compounds in the method blanks detected at concentrations above the Reporting Limit (RL)? Yes No. If yes, were these compounds phthalates and were they reported at < 5 times the RL? Yes No. 101/104

Action: - Blanks should not contain contaminants above the RL except for phthalates that must not be present above 5 times the RL. The Blank Action Level is defined as five times the highest level seen in any of the matrix-matched blanks associated with this SDG, except if phthalates are present, in which case the Blank action is ten times the highest level observed in any matrix-matched blank. The following actions should be taken if conditions warrant:

- 5. If the blank is not matrix matched, qualify all sample data, for the contaminant associated with this blank, with BB or EB, as appropriate.
- 6. If the reported result in a sample is below the reporting limit (sample < RL) and if a matrix-matched blank contains a result above the quantitation limit (blank > RL), the result in the sample should be negated (U) and raised to the sample-specific RL for that sample
- 7. If the sample result is between the reporting limit and the blank Action Level (RL < sample < Action Level), the result for the sample is negated (U) at the level found in the sample. Based on the level of contamination suspected in the sample, the reporting limit may be elevated. Professional judgment will be used in assessing the action needed.</p>
- 8. If the sample result is greater than the RL and the blank Action Level, no action is taken.

Comments: Blanks evaluated: RB 6127, RB 6121, RB 6121, RB 6122 + RB 6123; MB Highest Blank: Action taken: No Blank Action lequired							
Sample ID	Compound	Reported Result	Result based on Blank Action				

Additional Notes: RBS reports in Surface whiter 506.
Additional Notes: RBS reported in Surface white SDG. RB 16/17 - A11 ND except Di-n-buty/phthalate at 6/13/1_ RB 6/18 - A11 ND
RB C/18 - AII ND
RB 6/21 -A11 ND
RB G/22 - All ND except DI-n-butyl phthalata at 24/15/1
RB 6/22 - All ND except Di-n-butyl phthalata at 24/15/12 RB 6/23 - All ND except Di-n-butyl phthata at 25/15/12
Di-n-butylphothalate was not detected in any of the
Di-n-buthleholate was not detected in any of the field sediment angle therefore, no qualification of the data required.
MSOFOIBI - No Analytis Detected
<u></u>

Surrogate Spike Recoveries

The surrogate spike recoveries are reviewed to assess the accuracy of the results relative to laboratory performance and specific sample matrix.

Review the Surrogate Recovery information for each field and quality control sample. For one sample, verify that the recoveries reported correspond to the raw data and that the recovery calculation was done properly. Were the recovery data reported properly? Yes No.

Were the surrogate recoveries within QAPP defined and method-generated accuracy limits? Yes (No.) If no, were the affected samples reanalyzed? Yes (No.) List below the affected samples.

Action - If two Base/Neutral (BN) or two Acid surrogate recoveries exceed the upper limit, estimate (J) positive results (for the fraction affected) due to a potential high bias of the results; no action is required for non-detect results. If two BN or 2 Acid surrogate recoveries are below lower accuracy limit but above 10% recovery, estimate (J and UJ) the positive and non-detect results, for the affected fraction, due to a potential low bias in the results. If any surrogate recoveries are below 10%, reject (R) non-detect results and estimate positive results (J) due to potential false negatives and low bias in the results, respectively.. List below the affected samples and required actions.

Comments: Due to Linited Sough 5: ze after freeze dying, the
extraction for Semivolation. Perticide + PCBS were done together.
Since the acid Svoc surrogates would have interfaced with the Protricile
analysis, these weren't added - only BN Surrogates Used.
All Surregula within witerin except 2-Fluorobiphonyl in
5D-5 Dup which was recovered above criteria (14990 Capact
to 30-11590 onteria). Since other two BN Surrogetts were OE,
no action taken. Lab narrative also indicate that clerated Surget
recovery in Sigh may be due to the fact that Singh was an
at a dilution (DF=4)
- Surrogate - 10 ugloch Conc Inc Spiled - sugh final volue = 24 ml =>
On-colum Cone. for Surrogates = 2.5 mg/ml

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recovery and Precision

The matrix spike/matrix spike duplicate (MS/MSD) recoveries are reviewed to assess the accuracy of the results relative to the specific sample matrix and the relative percent differences (RPDs) are reviewed to assess the precision of the results relative to the specific sample matrix.

Review the unspiked sample, Matrix Spike, and Matrix Spike Duplicate (MS/MSD) raw data and recovery results. Were the recoveries for the MS/MSD calculated properly (Yes) No.

Did the laboratory perform MS/MSDs for each matrix and matrix level analyzed for each analytical batch prepared for analysis? (Yes /No. If no, list below the affected samples.

Were the MS/MSD recoveries and precision within QAPP and method-generated accuracy limits? Yes / No. Were the RPDs between the MS/MSD within the QAPP precision criteria? Yes / No. If no, list below the affected compounds.

Was the %RSD for non-spiked compounds in the unspiked sample, MS and MSD ≤ 50%? Yes / No (NA)

Action: No action is taken to the entire data set based on MS/MSD results alone. The unspiked sample may be qualified based on MS/MSD results as follows: if the MS/MSD recoveries were greater than the upper accuracy limit, estimate (J) positive results due to potential high bias; no action is required for non-detect results; if the MS/MSD recoveries were below the lower accuracy limit but above 10%, estimate (J and UJ) positive and non-detect results due to potential low bias; if a MS/MSD compound was recovered below 10% or not at all, estimate (J) positive results due to potential low bias and evaluate the non-detected results to determine whether estimation (UJ) or rejection (R) of the unspiked sample data is warranted. If the RPD between the MS and MSD > QAPP criteria, estimate (J and UJ) positive and non-detected results in the unspiked sample. If the %RSD, for a non-spiked compound, between the unspiked sample, MS, and MSD > 50%, estimate (J) positive results and use professional judgement to qualify other detected and non-detected analytes.

Comments:

50-03 ms + msD dn. In ms, 4-Nitrophnol 90Rc= 1408 (critin= 11-1146) however
MSD 90Rec Je 4-Nitrophenol was acceptable. 50-03 didnit report 4-Nitropheno
Mentine no action taken bused on high Recover in ms.
- Acenaphthme in Ms Forec = 7190 (OK), MSD = 5590 With RPD = 2590
(criteria for RPD = 195) - Actim: Result for Acenaphthone in SD-03
qualified as estimated (J) due to imprecisim.
- Pyrem - Sough reputed 6100 usley and spile led wa 712 time
lower than land in unspiked sugar (ic. not approprieta). 90 Rec MG-250
msp 90 ex = 050 + RPD= 20090 - No Actim taken to quality Pyran
result since, bush on professional judgents the spile had ween't New Environmental Horizons, Inc.
8-SVOC New Environmental Horizons, Inc.

8. Laboratory Control Sample and Standard Reference Material Analysis

The Laboratory Control Samples (LCS) and/or Standard Reference Material (SRM) are reviewed to assess the accuracy of the results relative to the analytical procedure.

Review the raw data and recovery information for the LCS/SRM.

Did the laboratory perform a LCS or SRM for each matrix and matrix level analyzed? (Yes) No. If no, list below the affected samples.

Were the LCS or SRM recoveries within QAPP and method-generated accuracy requirements for recovery? Yes (No.) If no, list below the affected compounds.

Action: If the LCS or SRM recoveries are above criteria, estimate (J) positive results due to potential high bias, no qualification of non-detected results is necessary. If the LCS or SRM recoveries are between 10% to the lower recovery limit, estimate (J and UJ) positive and non-detect results for the samples associated with the analytical batch due to potential low bias in the results. If the recovery in the LCS or SRM is less than 10%, estimate (J) positive results due to low bias and reject (R) non-detect results due to potential false negatives.

Or except Pentachloophnol at 0% Rec

Comments:

- SRM 1941a. (Originics in Marine Sedinat) also analyzed. Recovery of details

(analyzed for and > ~ O.1 x RL) was between 35% - 78% recovery of transport

PAHS.

Lub cooked, on 10/8/98 to review Pentrub/rophenol in LCS-manual

Palelization indicated that indeed this angula war it recovered. It

Should be noted that Pentrub/rophenol in MS + MSD was recovered without criteria. Lab indicated that this analyte has shown recovered issues in Black mathematics but is ox in ms/msDs (actual mathem).

* Action: Bused on professional judgment, since other acidic analytes whe recovered within criteria and since offer acidic analytes whe recovered within criteria and since ms/msD for Pentrub/mophenol in all samples has been qualified as estimated (UI) band a prov recovery of this analyte in the LCS. Potential low bias in clata.

The

9. Internal Standards

Commente

The Internal Standard (IS) response in the samples and standards is evaluated to ensure that the analytical system was in control during analysis.

Were the IS areas for each sample and standard analyzed within -50 to + 100% of the continuing calibration? Yes/No. Were the retention times for the IS within ± 30 seconds from the retention time established in the continuing calibration? Yes/No.

Action: If an IS area is greater than +100% compared to the continuing calibration, qualify positive results as estimated (J), non-detects do not require action. If the IS area is below -50% but not lower than -80%, estimate positive and non-detected results (U and UJ). If the area drop off or retention time shift for the IS is too severe (>-80%), non-detected results may require rejection (R). Professional judgment must be used in evaluating the data associated with poor IS performance.

Contained to
All Is were within oriterin- no action required
(Nuts Form 8's - Lub incorrectly put loose Limit le RT
(Note Form 8's - Lub incorrectly put Upper Limit for RT in Law Limit spot on from + vice versa - documentation
errur).

10. Sample Quantitation Limits

Review raw data and reporting forms. Did the sample-specific RLs meet the QAPP criteria? Yes No. Did the laboratory accurately adjust sample reporting limits to account for sample specific preparation and analysis conditions? (Yes) No.

Were all components reported in the samples quantitated within the calibration region of the instrument for the detected analytes (Yes/No) Were the relative retention times for all components reported within the retention time windows established during initial calibration? Yes/No

If the sample analyses were performed at dilutions, were more concentrated analyses performed or was sample screening information included in the data package? (Yes) No.

Were sample dilutions appropriate relative to scaling of the chromatograms and the calibration levels employed (e.g., peaks of interest within upper half of the chromatogram and quantitation done within the calibration range)? (Yes) No.

Action - If the quantitation limits for non-detect results are lower than the lowest calibration standard, or if a positive result is detected outside of the calibration range, estimate positive and non-detected results (J and UJ).

Comments:

- Due to Limited Sough size, The Peoticide+ SUOC extraction was due together.
The wevall analysis Schone was:
300 - 7 Ant extract 7 Inc 8270c Analysi
> 2 mc GPC -> 2 mc Affact > Imc 8081A/8082 Class
Therefore, the SVOC fraction was equivalent to 30g some being extracted
to a final Vilm of 4ml (as reported on the Form 15)
The QAPP requested ~ 170 mg/m, assuming 100 gosolido, for 500cs i however.
lub was only able to report dun to 270 mg/my (assuing 100% solids)
- Sward singles were analyzed at no dilution and at a secondary
dilution since some congunds were an base runge in the undilutil
exthat. In their instance, the dilution result would be used for the sager
value (i.e. replace result in undilute single) for the over-range compands

11. Field Duplicate Precision

Comments:

Field duplicate samples are reviewed to assess representativeness of the sample aliquot to the area sampled and the precision of the results relative to field sampling techniques.

Review analytical results for the duplicate sample analyses.

Action: If field duplicate precision exceeded 30% RPD for aqueous samples or 50% RPD for sediment or biota samples for any compound, estimate (J and UJ) positive and non-detect results for the affected compounds in both samples. If severe imprecision was noted in the field duplicate sample (i.e., RPD >100%), qualify the remainder of the associated field sample data based on sound technical judgment.

30-5 (Dup) Field Duplicate Samples: 50 -5 - See page 12A-SVOC where Precision Evaluation Made Super. Precision objective of RPD = 50% generall It should be noted that: 90 solids 50-5 = 97.3190 while 50-5(Dup) = 55.07% 50-5 analyzed at no dilutin; SD-5(Dup) Analyzed at 1:4 3) The "raw" on-column concentrations for 50-5 and SD-5 (Dup) show good Comparability. 4) only 1099 50-5 available for extraction (50-5000) im ~309 ext.) Therefore, it appears in though precision compromised du * Actions token as noted in page 12A-SUOC. Nopaction was 12/7/99 taken an results where both saight reputed concentrations less than the Reporting Limit Calready Plagged J, estimated) even though RPD > 50%. - Several Dates Sayad were incorrect on the excel Datatables these dates were corrected during this assessment.

Field Duplicate Precision Evaluation

	SD-5	SD-5	SD-5 (Dup)	SD-5(Dup)			
	42563-1	Sample Result	42563-3	Sample Result			
Analyte	µу/Кд	RL = 810 ug/kg	µg/Kg	RL = 1900 ug/kg	RPD	Action	
Phenol	340	< RL	760	< RL	76,4	No Action	
Naphthalene	550	< RL	1100	< RL	66.7	No Action	
Acenaphthene	390	< RL	1200	< RL	101.9	No Action	1 1 70
Fluorene	680	< RL	2000	>RL but <2 x RL	98.5	J SD-5(Dup) -	750-5 already
Phenantivene	5900	> 2 x RL	15000	>2 x RL	87.1	J Both	\$50-5 already J" due to uncertainty in reporting between MDL and RL
Anthracene	640	< RL	1800	< RL	95.1	No Action	in reporting between
Fluoranthene	12000	> 2 x RL	26000	>2xRL	73.7	J Both	MDL and ORL
Pyrene	7900	>2 x RL	19000	>2 x RL	82.5	J Both	
Benzo[a]anthracene	3100	> 2 x RL	5600	>2xRL	72.2	J Both	Anc 12/1/19
Chrysene	6500	> 2 x RL	14000	> 2 x RL	73.2	J Both	In ber
bis(2-Ethylhexyl)phthalate	3700	>2 x RL	4500	>2xRL	19.5	No Action	12/11/1
Benzo[b]fluoranthene	6400	>2 x RL	14000	>2×RL	74.5	J Both	
Benzo[k]fluoranthene	5600	>2 x RL	11000	> 2 x RL	65.1	J Both	
Benzo[a]pyrene	3700	>2xRL	9300	>2 x RL	86.2	J Both	
Indeno[1,2,3-cd]pyrene	3100	>2 x RL	7300	>2 x RL	80.8	J Both	
Dibenz[a,h]anthracene	670	< RL	1500	< RL	76.5	No Action ~	salready" J "be rayed
Benzo[g,h,i]perylene	2300	>2 x RL	5900	>2xRL	87.8	J Both	salready" J "be cause $\lesssim KL$.
2-Methylphenol	230	< RL	530	< RL	78.9	No Action -	H 74.
Dibenzofuran	460	< RL	1200	< RL	89.2	No Action	ا ت
Carbazole	1100	>RL but <2 x RL	3100	>RL but <2 x RL	95.2	J Both	

parx 12A-SVOC

12. Additional QA/QC Issues

Were the percent solids for the samples >30%. (Yes) No / NA.

List any additional issues which may affect the quality of the results. List the affected samples, QA/QC issue, and necessary actions taken in the comments section below.

Action: If the %solids were between 10% and 30%, qualify positive results as estimated (J) and reject non-detected results (R). If the %solids were < 10%, reject (R) positive and non-detected results.

Note: Frank-duning drumatically improved 90 solids Contents (VOA, un-frege third aliquets were all while all succe war 41-9770 501 dol - Only 10.1 g available for overation after Mso Smph 42562-1 (50-2) was dramed durin 8.36 a available to actually extra so only , SD-7 + SD-6 original above calibration rung. Single veran at diluters (runs shan as "E" analysa). During data assessment, the original analogue was conqued and all should good companish frall detected analytes; Therefore, in the database, The results associated with these supers are all from the original undiluted except for those analyte above calibration range which were "replaced" with the value determed in the dillation analysis - For example: 50 -> Reported only Fluoranthere above range (all other analytes within range) at 9600 E, SD-07E (1/2 Dilutia) reported Fluoranthe at 8300 D - In The database, results for SD-7 are from 1:1 Analysis except for Fluoranthene which was reported from the SD-7E value

IVB. Example Sample Calculations

RRF = 1,328

Review of one sample per data package is performed to determine if sample results and quantitation limits were correctly calculated and reported.

Sample ID: 50-03 was selected for review in this data package.

A. Form 1 Review

- 1. Were the Form 1s for completed according to the method/QAPP requirements? Yes No. If no, list below the affected fields.
- 2. Reproduce the reporting limit for SVOC in one of the samples, did the laboratory correctly calculate the quantitation limits? Yes No. If no, list below.

Reproduce a calculation for one semivolatile analyte in one of the samples that contained a positive result and compare the calculated result to the result reported by the laboratory.

Industriplex - 1999 Pesticides + PCBS - Sediment

8081A and 8082 Data Usability Review

IIIC. Review of Data

1. Holding Times

Comments:

Holding times and QC association with the samples are reviewed to ensure the accuracy of the reported results. The table on the following page (Table 1a) was completed to document the holding times and QC association.

Review the Pesticide and Aroclor Data Sheets.

Were the holding time requirements (surface waters extracted within 7 days; sediment and biota extracted within 14 days of sampling (or thawing for biota) and extracts analyzed within 40 days of preparation) met for each sample? Yes No. If no, list below the affected samples and the number of days outside of holding time.

Action: If the holding times were slightly exceeded, estimate (J and UJ) positive and non-detect results. If the holding times were grossly exceeded (more than twice the allowed holding time), professional judgment should be used to determine the action necessary. Evaluation of screening, undiluted and dilution analyses, if available, should be made to determine the impact of the holding time violation on the data quality (e.g., whether or not positive values are estimated (J) and whether non-detected values should be estimated (UJ) or rejected (R)).

No Action Required - all HTS met.	
Temp 1°C recorded on coc for 6/21/99	,
Temp 1°C recorded on coc. for 6/21/99 No Action - see pg 1 - voc.	
	

Table 1a. Holding Time and Associated QC Table

Sample Matrix: 14 Sediments + 1 ms ms

Sample ID	Date/Time Sampled	Field Blank	Method Blank	LCS	Date/Time Extracted	Date/Time Analyzed
5004 (42537-1)	617 99 118	RBGIT	MS070181	m5070161 m5070162	7/1/99	7/2/99
5D12 (-4)	617 1518		<u> </u>			7/21/99
50-13 (-6)	6/17 15/30					7/21/99
50-03 (-1)42541	6/18 11:30	RB 6 18				7/24/90 + 7/27/99
50-03 ms (-1ms)	6/18 12:10		 			7 24/24
50-03 msb (-1msb)	6/18 12:30	<u> </u>	<u> </u>	<u>U</u>	1	<u> </u>
Rinsate Blak (1) 12	6/17 11:00	NA	Puloc2381	1006231	6/23/99	7/15/99
Rinsete Blak (118	6/18 14:30	N/A	<u> </u>	<u> </u>	<u> </u>	
50-2 (42562-1)	6121	RB 6 21	745 07018 I	m40901L1 m50301L2	7/1/99	7/22/91
50-01 (-4)	6 21				1	7 22 + 7 27/29
50-10 (-4)	6121				<u> </u>	7/22/99
5D-11 (-8)	6 21			<u> </u>	<u> </u>	7/22/99
3 6 21 (-3)	6121	NA	PWOWSBI	LM0652517	6/25/99	71.799
50-5 (42513-1)	6/22	RB6/22	msofal B1	MSO TOILI	7/1/99	7 22 95
50-5 DUP (-3)	6 22		<u> </u>			7/22/99
50-9 (-5)	6122		 			7/24/99
50-8 (-7)	6/22	<u> </u>	<u> </u>			7 24 99
6D-7 (-10)	6123	RB 6/23				7/24/99
5D-6 (-12)	6123	— /	<u> </u>		1	7/29/99 +7/24/90
RB 6122 (-9)	6/22	N/A	PW062581	LW0625L2	625 99	7/17/99
RB 6/23 (-14)	6123	NVA	<u> </u>		<u> </u>	4
		<u> </u>				
			ļ			
			<u> </u>	<u> </u>	<u></u>	
			1			

^{*} RB Data submitted with Surface Wester 504

2. GC/ECD Instrument Performance Check

The instrument performance check, called Performance Evaluation Mixture (PEM) is analyzed to ensure the accuracy and sensitivity of the results relative to instrument performance.

Review the PEMs for the Pesticides.

Was the degradation of 4,4'-DDT to 4,4'-DDE and 4,4'-DDD <15% and was the degradation of Endrin to Endrin aldehyde and Endrin ketone < 15%? Yes No. Were all compounds in the PEM 90% resolved on each GC Column Yes No. If no, list below the affected samples.

Was a PEM analyzed daily or every 12 hours o instrument use? Yes No. If no, list below the affected samples.

Action: If resolution of the PEM compounds is not acceptable (on one or both columns) professional judgment must be used in qualifying data. For example, if resolution is poor on both columns for two analytes, and if a sample reports one or both of these analytes as detected, the positive results should be qualified as estimated (J) due to uncertainty in quantitation and possibly in qualitative identification. If the breakdown for DDT and/or Endrin exceeds 15%, qualify all positive results for these compounds as estimated (J). If these two compounds are not detected, but their breakdown products are detected, qualify the DDT and/or Endrin non-detect result as rejected (R) and qualify the breakdown products as estimated (J).

Comments:						
PEM 'S	all or-n	sactim v	equired.			
·			1			
				······································		
						
		 				
						
	_,					·
			· -			
						

5. Initial Calibration

The initial calibration data are reviewed to determine if the standards were compliant with the method protocols.

Review the Initial Calibration Data Summary for Pesticides and PCBs. Were linear (RRFs or CFs) statistics or calibration curves used in the initial calibration? Linear (Curve) If linear calibration, check and recalculate at least one pesticide compound and one peak for an Arochlor across the ICAL. Does the RRF and %RSD check back to the raw data? Yes / No. Did the initial calibration meet %RSD criteria of \leq 30% for all analytes (surrogates and targets) across the calibration range? Yes / No. If no, was the average %RSD for all analytes in the calibration \leq 30%? Yes / No. Were the RRFs for all analytes in the standard all greater than or equal to 0.05? Yes / No - No Curve (Cobb).

If curve statistics were used for the initial calibration, was the regression coefficient > 0.99? Yes // No.

Were the curves generated with sufficient points (linear with 5 points, quadratic with 6) Yes / No.

Was the curve forced through the origin? Yes (No) If yes, resubmittal of calibrations and samples must be requested to correct this non-compliance issue. L lespreceded data all 0 C. lesularity lequities.

Was the lowest initial calibration standard at a concentration equivalent to the sample-specific reporting limit. Yes No

Were retention times for each target analyte stable across the calibration (i.e., minimum drift) (Yes) No

Action: If the %RSD >30% and average RRF ≥0.05, qualify positive and non-detected results as estimated (J and UJ). If the %RSD >30% and average RRF < 0.05 estimate positive results (J) and rejecy non-detected results (R). If the %RSD ≤ 30% and average RRF < 0.05 estimate positive results (J) and reject non-detected results (R). If the regression coefficient < 0.99, qualify positive and non-detected results as estimated (J and UJ). Sound technical judgment should be used in qualification of the data. The results for each sample associated with ICAL should be evaluated to determine if a result reported would be impacted by the mis-calibration. For curve analysis, if the percent Difference (%D) between the calculated area and the reported area > ±25%, qualify positive and non-detected results as estimated (J and UJ).

Comments:

Linear Pesticide ICAL Check: Compound Checked _____

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Avg. RRF	%RSD
Concentration								
Response Cpd								
Conc, IS								
Response IS	<u></u>							
RRF								

3. Initial Calibration - continued

Linear PCB ICAL Check: Compound/Peak Checked

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Avg. RRF	%RSD
Concentration	_							
Response Cpd								
Conc, IS								,
Response IS								
RRF								

If curve statistics are used, verification of the computer generated equation may be difficult across the ICAL. Instead, a check is made for one pesticide and one PCB peak to determine whether the equation matches the data obtained as follows:

Curve equation:

$$y = a + bx + cx^2 + dx^3$$

Where:

or
$$y = Area compound (external std. calibration)$$

or
$$x = Conc.$$
 compound (external std calibration)

Since solving for x is somewhat difficult, the system is checked by using the Calculated Compound Concentration to solve for the Area of the compound as follows:

Pesticide Compound evaluated: 441-DDD - Channel A

Standard evaluated: 8081 L4

ICAL calibration formula:

$$y = (0.007328) + (0.840948) x + (-0.010336) x^2 + 0x^3$$

$$r^2 = 0.999185$$

Reported	IS	Calculated x	Calculated y	Area of IS	compound	Compound
19.9568	50	0.3991	0.3413	94253	32172	35031
		<u> </u>			%Difference	8.2%

_					_
7	Instal	f'olishe	whom —	- continu	~
э.	ишиа	Campi	шип –	- Comunica	~

PCB Peak evaluated: Avactor 1016 peak # 3 - Channel B - 7/2/99 1CAL
Standard evaluated: 166014

ICAL calibration formula:

Y= (1963.348543) + (140.610928)x + (-0.008285)x2 + 0x3 r= 0.999659

Amount Reported	Amount of IS	Calculated x	Calculated y	Area of IS	Calculated Area of compound	Reported Area of Compound
302.1303		302.1303			43690	38703
				•	%Difference	-12.9%

Pest 1CTZ m 7/20/00 - 2 PCB ICALS - come on 7/21/94 + anoth on 7/23/94

- Resubmitted data for Proticides ICALS, CCALS + 5 comple accessed 10/11/94
Original data used Curves for Proticide that were found through the oxigin (see page 30/00 Resubmittel veguent).

- Lab's launt ICAL for Pest = 2 ms/me - RL based on 5 ms/mc (consorration) was final RL using 5 ms/mc meets QAPP RL - Standard Ing show 5 ms/mc (nort. 10/12/14)

- Luwest ICAL Stal for PCBS = 20 ms/mc => RL = 20 × 30 = 2.7 × meets

QAPP RL requiremt.

Continuing Calibration Check

The continuing calibration data are reviewed to determine if the standards were contractually compliant.

Review the Continuing Calibrations (CCAL) and Summaries. If average RRFs or CFs are used, check and recalculate the RRF and %Difference (%D) for at least one of the Pesticides and one of the PCBs in one of the CCALs. Does the RRF or CF and %D check back to the raw data? Yes/No Were the RRFs for all analytes in the standard all ≥ 0.05 ? Yes/No $\rightarrow N$ at applicable $\rightarrow C$ with which

If curve statistic calibrations were used, check one of the CCALs for one Pesticide and one peak for a PCB to determine if the calibration relates properly back to the corresponding ICAL. Do the CCALs properly reference the correct ICALs (Yes) No.

Was a continuing calibration check performed every 12 hours following tuning verification of the instrument? (Yes) No. If no, list below all the affected samples.

Were the target analytes recovered within the expected retention time window based upon the initial calibration (i.e., drift of instrument was acceptable) Yes No.

Did the continuing calibrations meet 8081A and 8082 criteria for verification of %D $\leq \pm 15\%$ or %Drift $\leq \pm 15\%$ for every compound? Yes (No) Did the continuing calibrations meet 8081A and 8082 criteria for verification where the average of all compounds analyzed had %D $\leq \pm 15\%$ or %Drift $\leq \pm 15\%$ for every compound? Yes) No If no, list below the outliers and the affected samples.

Action: If the %D or %Drift for a compound $\geq \pm 15$ %, estimate positive and non-detected results (J and UJ) for samples analyzed following this standard for the compound(s) that was outside of calibration.

Comments:

Linear CCAL Pesticide	check:		
CCAL Check: Standar	d ID: (Compound Checked	
Responses	RRF/CF	avg. RRF(CF) ICAL	% Difference
Cpd:			
IS:			
Linear CCAL PCB chec CCAL Check: Standan		PCB/peak Checked	
Responses	RRF/CF	avg. RRF(CF) ICAL	% Difference
Cpd:			
IS:			

4. Continuing Calibration Check - continued

If curve statistics are used, verification of the computer generated equation may be difficult across the ICAL. Instead, a check is made for one pesticide and one PCB peak to determine that the correct equations were used to generate the amount found in the CCAL standard

Curve equation:

$$y = a + bx + cx^2 + dx^3$$

Where:

or y = Area compound (external std. calibration)

Area Internal Standard

or x = Conc. compound (external std calibration)

Concentration IS

Since solving for x is somewhat difficult, the system is checked by using the Calculated Compound Concentration to solve for the Area of the compound as follows:

Pesticide Compound evaluated: Aldrin

Standard evaluated: 72180812 - Channel B

ICAL calibration formula:

$$y = (-0.000259) + (1.208692) x + (-0.114803) x^2 + 0x3$$

 $y^2 = 0.999197$

1	8.3512	50	0.3676	0.4286	178436	%Difference	0.001%	
	Amoun	Found	Theoretic	al Amount	%	Drift		-
	18.38	12	20		8.17			

Lub convention for 900 on For	ms In CCAL = A	nt Cale-True - apposite	
SIA. CHAMATIN. All IDE	Marie given o	dru use the lab's convente.	~
Ces reports. Pest CCAL 72180811 - 90D		+ B All = 15% -OK	
		Tmx = -17%; channel B: -12	248
No action to the since 70!	Drift Endosulfur 1 Drift ok an one.	on A = -990; Channel B = -17 1 The Channels of Each Comp.	-% ~~.
	R. Pest/PCR	New Environmental Harizons Inc	

4. Continuing Calibration Check - continued

PCB and Peak evaluated: AR1260 Peak #5

Standard evaluated: A 9721601 - Channel A

ICAL calibration formula:

 $y = (1944.307271) + (65.366606)x + (-0.001819)x^2 + 0x^3$ $y = (1944.307271) + (65.366606)x + (-0.001819)x^2 + 0x^3$

Amount Reported	Amount of IS	Calculated x	Calculated y	Area of IS	Calculated Area of compound	Reported Area of Compound
1000.8379		100018379	65544		65544	65544
				· · ·	%Difference	0%
Amoun	t Found	Theoretic	al Amount	%	Drift	
1006.5	5	1000	>	-0.66	7.	

- 100 CCAL 72380811 Endosafta_1 channel 4876, channel 8 = -186-
No action buten since Channel BOK
- Pest CCAL 72380813 - 11 Channel A Companto > 15% Drift, 3 Chancel B at
Conquido Out on both chamacle:
Aldrin Channel A = -19%; Channel B = -16%
Heptachlu Epoxide Chanle A = -19%; Channe B = -17%
This was an ending calibration standard (no single analyzed after this)
since opening std (72380811) was OK-no action token based on this
nm-compliant CCAL.
- Pest CCAL 72980811 DDT 21% Drift Chand A; 7% Channel B - OK
Methoxychlu 20% Drift m A; 23% m B
This CCAL run printo Suph 42563-12 (Dilutter Dam of 50-6 could
SO GENOR 10/20/29 - 5 angle SD-G - McMosychin ND -
* Action: The non-detect result for hubbarycla in 50-6 has been
qualified as witnested (UI) 9- Pest/PCB New Environmental Horizons, Inc.
do a now as but of CCAL to this remains to

Additional Notes:

Pest CCAL 72980812 - 4,4'-DDT + muthometha 90 Drift > 15%

an Channels A + B - This was The ending sequence

Standard (no singles analyzed after this) => No action

taken based on This non-conglishment CCAL.

PCB CCAL A 9721601 -All OK

PCB CCAL A 9721602 - ending sequence CCAC - Ar 1260 FD Diff

> 1590 an Chunnolo A+B (2390 + 1620) - Prin CCAL OK >

no action toler bused an fhis non-englant ending CCAL.

PCB CCAL A 9723602 - Tonx Chunnel A ant ; AR1260 Chunnel

Bat (2290 Drift) - Since the other chunnel 90 Drift for

these analytic was acceptable + since named the sample

anociated with this CCAL reported positive detects for AR1260,

no action taken.

PEB CCAL A9723603 - ending sequence CCAL - ARIONO Champel A=

3290; Champel B = 1890; ARIZED Champel A= 2390, Champel

13 = 3490. This ending CCAL indicat increased sensitivity

to detection of ARIONO + ARIZED (90 D convention reversed >)

+ 70 Drift = 0 increased sensitivity f- Pest/PCB data). Since

none of the songles in the sequence analyzed immediately

prior to this standard regard positive results for ART war

cary Aroclar, no action taken based on this non
captiant CCAL since instruct approach none sensitive

Than during ICAL to the analytic of interest >> the non-detection

Thoults are considered as captable.

Note: For those CCALS that had analyte with 90D>15%, the sage data was checked to ensure that the reported result of an analyte was not reported of of a channel with a non-emplicate CCAL (i.e, even if I channel Ok but other not => no overall action taken the data was checked to make sue all values regulated had the correct Channel CCAL in Capitana for the analyte of A-Pest/PCB reported).

5. Laboratory and Field Blank Results

Laboratory and field blank results are reviewed to assess the presence of contaminants, which affect the accuracy and sensitivity of the results. See Table 1a. where the Holding Time and Associated QC Table was completed for the samples within this SDG.

Was each sample analysis associated with the appropriate method blank, ie., correct matrix, correct matrix level, same extraction batch? Yes / No. If no, list below affected samples. Were Cleanup Blanks analyzed? Yes No/ NA.

Black data for cleanup not reputal since method blanks of Review the reporting forms for each method and field blank. Were any target compounds in the method blanks detected at concentrations above the Reporting Limit (RL)? Yes /(No.)

Action: - Blanks should not contain contaminants above the. The Blank Action Level is defined as five times the highest level seen in any of the matrix-matched blanks associated with this SDG. The following actions should be taken if conditions warrant:

- If the blank is not matrix matched, qualify all sample data, for the contaminant associated with this blank, with BB or EB, as appropriate.
- 10. If the reported result in a sample is below the reporting limit (sample < RL) and if a matrix-matched blank contains a result above the quantitation limit (blank > RL), the result in the sample should be negated (U) and raised to the sample-specific RL for that sample
- 11. If the sample result is between the reporting limit and the blank Action Level (RL < sample < Action Level), the result for the sample is negated (U) at the level found in the sample. Based on the level of contamination suspected in the sample, the reporting limit may be elevated. Professional judgment will be used in assessing the action needed.</p>
- 12. If the sample result is greater than the RL and the blank Action Level, no action is taken.

Comments: Blanks evaluated:	RB COLIT, RB	6/18, RB 6/21, R	ms of B 6/22, RB 6/23 + MB	DIBI Nor lojzolar
Highest Blank: Action taken:	No Bluc	Actin Required		
Sample ID	Compound	Reported Result	Result based on Blank Action	7
				-
]

6. Surrogate Spike Recoveries

The surrogate spike recoveries are reviewed to assess the accuracy of the results relative to laboratory performance and specific sample matrix.

Review the Surrogate Recovery information for each field and quality control sample. For one sample, verify that the recoveries reported correspond to the raw data and that the recovery calculation was done properly. Were the recovery data reported properly? Yes No.

Were the surrogate recoveries within QAPP defined and method-generated accuracy limits? Yes / No. If no, were the affected samples reanalyzed? Yes / No. Did the chromatography of the affected samples show interferences? Yes / No. Was the retention time (RT) of the surrogates within criteria (Tetrachlorom-xylene within \pm 0.05 min and Decachlorobiphenyl \pm 0.10 min from average RT of surrogate from ICAL) (Yes) No. List below the affected samples.

Action – Professional judgment must be used in qualifying data for Pesticides/PCBs based upon the surrogate recoveries. If recovery is outside of criteria on one column, but acceptable on the other, and all quantitative results are obtained for the samples on the second column, then qualification of the data may not be required. If quantitation is reported for a particular column, and surrogate recoveries are outside of criteria, the following actions may be taken: if 10% < % Rec < Lower Acceptance Limit, qualify detected and non-detected results as estimated (J and UJ); if <math>% Rec > Upper Acceptance Limit estimate detected results (J), no action required for non-detects; if <math>% Rec < 10%, estimate (J) positive results and reject (R) non-detects. A review of the data for both columns, comparing sample chromatograms to standard chromatograms, must be done and professional judgment must be used to determine if action is warranted. List below the affected samples and required actions.

Comments:

Sweed Sugar shared Interferences on one or the other column -
very complex matrices - lab used judgment in reporting surregate
recovering using the following extrict
Column A + Column B 90RPD > 405 lab generally
chose highest value unless Intergrence was observed. For
those sugh with RPD > 40%, Lab Qualified Data wing
"P" or "I" - For all sough, "P" Indicated that higher
value was reporter (apposite of CLP convertin) - for Surregula, took
To Dec chedred + unlin there was some Interference (as Qualifica
as I by lab) all surget for both columns out arrestrick
No Action Required

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recovery and Precision

The matrix spike/matrix spike duplicate (MS/MSD) recoveries are reviewed to assess the accuracy of the results relative to the specific sample matrix and the relative percent differences (RPDs) are reviewed to assess the precision of the results relative to the specific sample matrix.

Review the unspiked sample, Matrix Spike, and Matrix Spike Duplicate (MS/MSD) raw data and recovery results. Were the recoveries for the MS/MSD calculated properly? (Yes //No.

Did the laboratory perform MS/MSDs for each matrix and matrix level analyzed for each analytical batch prepared for analysis? (Yes) No. If no, list below the affected samples. — Do- us or per 500x bunds

Were the MS/MSD recoveries and precision within QAPP and method-generated accuracy limits? Yes / No Were the RPDs between the MS/MSD within the QAPP precision criteria? Yes / No list below the affected compounds.

Was the %RSD for non-spiked compounds in the unspiked sample, MS and MSD ≤ 50%2 Yes/No/NA

Action: No action is taken to the entire data set based on MS/MSD results alone. The unspiked sample may be qualified based on MS/MSD results as follows: if the MS/MSD recoveries were greater than the upper accuracy limit, estimate (J) positive results due to potential high bias; no action is required for non-detect results; if the MS/MSD recoveries were below the lower accuracy limit but above 10%, estimate (J and UJ) positive and non-detect results due to potential low bias; if a MS/MSD compound was recovered below 10% or not at all, estimate (J) positive results due to potential low bias and evaluate the non-detected results to determine whether estimation (UJ) or rejection (R) of the unspiked sample data is warranted. If the RPD between the MS and MSD > QAPP criteria, estimate (J and UJ) positive and non-detected results in the unspiked sample. If the %RSD, for a non-spiked compound, between the unspiked sample, MS, and MSD >50%, estimate (J) positive results and use professional judgement to qualify other detected and non-detected analytes.

Comments: 5:nce Pest/PCB single extractor day, only Pesticide Mu used.

50-03 ms + msD payamed. Lab used QC charting limits of accurated.

Limits reasonable, and in some cases the same, Compared to QAPP

Limits. Lab contracted trans it was learned that precision criticie (set

by lab at \$\leq 50\%) was anti-travily set \$\rightarrow\$ Assessed will be bound as

OMPP precision criteria.

MSD 90 Rec All OK except Endrin - 38% Rec Capted to 42-139% Citale.

MSD 90 Rec All OK except Aldrin - 30% Rec (35-130%) + 4, 4'-DDT at

177% Dec (23-134% Criteria). RPD Aldrin: 44% (1:miz \$\leq 4310), gamma-Bt.

RPD: 68% (1:mit \$\leq 50\%) talk other RPDs & QAPP Criteria.

Continued in next pay.

wn by 4'-DDT

Action: Results for the unspiked sough 50-03 have been qualified as estimated were interested for Endrin and Aldrin due to low recording of the spike conguents in the most most low and for gamma-BHC due to precision objectives not being the biased has achieved. Precision was also not acceptable for the Aldrin 12/7/49 determination.

The result for 4,4-DDT in SD-03 has beinguelified as estimated (J) due to the high recovery in the MSD single (ie. accuracy insues) - the result for 4,4'-DDT in SD-03 may be biased high.

Scriph SD 03 was analyzed at a DF=1 and then reanalyzed foo SD 03E)
at a DF=10. The ms ms were analyzed once at DP=1 (using CLP

Convention). In the analyzes of SD-03 at DF=1, alpha-chirdren was
detected on Column A but interference existed so Area=0 - not picked
up a Column B. During the DF=10 analyzes, alpha-chirdren was
detected on both Columns A+B and reputed on a positive result.

The pattern of Columns A+B of SD-03 ms + msD are simile to

the SD-03 DF=1 analyzes-fr ms+mid x-chirdren was Not detected
A congrison of unspiked results fr SD-03, ms + msD is as follows:
with in anyth SD-03 SD-03 ms SD-03 msb 70 RSD ACTIO

ACTION x-chlordne NM 4,4'- DDE 29 28.1% 43 53 None 4,4'-DDD 120 E 476 86 43.3% None

No Action taken to qualify the unspiked analytes in SD-03 based on the Conquisor between SD-03 and the ms + msD since i) noRSD L 50% and 2) of-Chlorolar result in SD 03 was bused on a DF=10 analyse + Since SD-03 ms + msD were run at DF=1, the x-Chlorolar was not detected;

page 12 A- Pest/PCB

8. Laboratory Control Sample and Standard Reference Material Analysis

The Laboratory Control Samples (LCS) and/or Standard Reference Material (SRM) are reviewed to assess the accuracy of the results relative to the analytical procedure.

Review the raw data and recovery information for the LCS/SRM.

Did the laboratory perform a LCS or SRM for each matrix and matrix level analyzed? Yes No. If no, list below the affected samples.

Were the LCS or SRM recoveries within QAPP and method-generated accuracy requirements for recovery? Yes (No.) If no, list below the affected compounds.

Action: If the LCS or SRM recoveries are above criteria, estimate (J) positive results due to potential high bias, no qualification of non-detected results is necessary. If the LCS or SRM recoveries are between 10% to the lower recovery limit, estimate (J and UJ) positive and non-detect results for the samples associated with the analytical batch due to potential low bias in the results. If the recovery in the LCS or SRM is less than 10%, estimate (J) positive results due to low bias and reject (R) non-detect results due to potential false negatives.

Comments:

LCS MSOFOLL	Results Folice all wi	thin OHPP Culteria	<u> </u>
msoti	olyged - all SRM Posts	al July track	A 0
<u> </u>	18	CIAL ACTORDA AMAN	and the same
results as follows	•		
Componed	Found Pagent (40/K)	SRM Cart. Volum	90 lic
x-chlorda.	4.1	2.33±0.56	17690
4,41-00E	6.0	6.59±0.56	9190
4,41-000	5 . l	5.06 20.58	101%

Actim: Recorn of x-chlordae in SRM high => positive detected results for the samples in this batch reporting x-chirdnemy also be biased high. Therefore positive detects qualified as estimated (J) - affects Surgla SD-03, SD-01 and SD-06.

9. Pesticide Cleanup Checks

Where cleanup protocols used on the Pesticide/PCB extracts? Yes No. If yes, what cleanups were used and what QC was generated to verify the adequacy of the cleanup.

Cleanup Protocol	QC Activities
GPC	
	Extra- Black Run + All Butch OC
Pimino-Propyl	Black Run + All Butch OC

Were all samples and QC from the original extraction put through the cleanup protocols? Yes No. Were there any QC results which indicated that the cleanup was not adequate? Yes / No.

Action: If a QC sample, for example Method Blank or LCS, demonstrates unacceptable results (e.g., contamination or loss of analytes of interest), the data associated with these QC samples may require qualification based on professional judgment.

Comments:	
QC sough (method Blubs, LCS, SRM) show no determent	Q
effect of CPC or Amino-proposi clarences on results -	-
	_

10. Sample Quantitation Limits

Review raw data and reporting forms. Did the sample-specific RLs meet the QAPP criteria? Yes No. Did the laboratory accurately adjust sample reporting limits to account for sample specific preparation and analysis conditions? Yes No.

Were all components reported in the samples quantitated within the calibration region of the instrument for the detected analytes? Yes/No Were the relative retention times for all components reported within the retention time windows established during initial calibration? Yes/No

Scriptor rearranged at Diluttons

If the sample analyses were performed at dilutions, were more concentrated analyses performed or was sample screening information included in the data package? (Yes) No. - Except 1. 50-6

Were sample dilutions appropriate relative to scaling of the chromatograms and the calibration levels employed (e.g., peaks of interest within upper half of the chromatogram and quantitation done within the calibration range)? Yes No.

Action - If the quantitation limits for non-detect results are lower than the lowest calibration standard, or if a positive result is detected outside of the calibration range, estimate positive and non-detected results (J and UJ).

Comments: QAPP reg. RL - Pest = 1.01/3/14 ; PCB = 10/15/14

Lower ICAL STA Pest = 5/15/14 = 5 Pest RL.

Songle 50-2 Pest RL = 2.6 Molly + PCB RL = 10.4 Mg/14 - This who

due to the fact that the original sough we dropped ou only

8.36 g remained fr analyses (92% solids => RL=5/16/14 × 8.36=92 = 2.6 Mg/14)

Sough 50-5 Pest RL= 20/16/14 since only 10.00 g was available

for extraction.

50-5 Dung Pest RL= 1.2 Molly - 30.13 g extracted but after freeze
drying the 30 solids = 55% => Cause for higher RL.

50-9 - 42% solids cause RL to raise to 1.6 Molky

SD-7 61% solids caused RL to raise to 1.1 Molky

SD-6 Required a dilution y 100 for analysis causing the

RL to raise to 7.6 Molky.

11. Field Duplicate Precision

Comments:

Field duplicate samples are reviewed to assess representativeness of the sample aliquot to the area sampled and the precision of the results relative to field sampling techniques.

Review analytical results for the duplicate sample analyses.

Action: If field duplicate precision exceeded 30% RPD for aqueous samples or 50% RPD for sediment or biota samples for any compound, estimate (J and UJ) positive and non-detect results for the affected compounds in both samples. If severe imprecision was noted in the field duplicate sample (i.e., RPD >100%), qualify the remainder of the associated field sample data based on sound technical judgment.

Field Duplicate Samples: SD-5 SD-5 SD-5 Dup	
Pesults for Posticident PCBs in both sough we non-detect => can not assess field duplicate precion These results.	iston broad
m inde vesions.	

12. Additional QA/QC Issues

Were the percent solids for the samples >30%. (Yes) No / NA.

List any additional issues which may affect the quality of the results. List the affected samples, QA/QC issue, and necessary actions taken in the comments section below.

Action: If the %solids were between 10% and 30%, qualify positive results as estimated (J) and reject non-detected results (R). If the %solids were < 10%, reject (R) positive and non-detected results.

Positive
-Results qualified as P" or "I" chicked (analytes for which the RFD
between Column A + B > 40%) - If Technical judgment will be used
to either accept result as reputed a to qualify result as cotimated (3)
Lab generally chose highest value to repet results unless interference
was severe. RPD = 50% used as benchmark (usangle/Dup Soil RPD critare) - 50-2 4,4'-00D Qualified P - highert lessett chosen. RPD = 46% - Result
reputed = highert value. Result accepted with qualification.

Action Sargh 50-6 - Sangh run at 1/10 Dilution. Result for gamma-Chlordon + 4.4'-DDD qualified P since RPDs > 50% Result Chosen was the highest value - Band on Technical judgment Since the RPDs > 50% (51 + 55%) The results for gamma-Chlordon and 4,4'-DDD have been qualified as estimeted (5) and my be biused high.

Date Singled in DB file incorrect for SD-2, SD-01, SD-10, SD=11, SD-5, SD-50, SD-50, SD-9 + SD-8 - Amended during this evaluation.

For Suga SD-7, the electronic file incorrectly regulate the 4,4'-DDE recult as Diddwin - during assessment this mistake was correctled

Additional Notes:

5D-03 and 5D-03E (DF=1 + DF=10) analogies provided since α -chlorida 44.4'-DDD over calibration range on DF=1 conalogis. During this assessment, the results for all DF=1 results accepted except for α -chlorida 44'-DDD which evaluated the DF=10 value. In the dathbase, the results for 5D-03 have been modified to report the duston in this again Manner [i.e. singh DB result for 5D-03).

5D-DI and 5D-DIE (DF=1+DF=25)-4,4'-DDE,44'-DDD+

4,4'-DDT ever calibration variet on DF=1 run. lesults from

DF=1 analysis accepted for all but These three conjund.

The DF=25 run used to report DDD, DDE+DDT in Databone.

In addition x-chircles detected in DF=25 run-not seen

in DF=1 run due to interferences => x-chircles from DF=25

associated with the 5D-01 Result.

During the review of the duty it was determined that the lab mys-reported

the 4,4'-DDE result for 5D-01E. A resubmithal vegetet (see page

3B) was issued to have the lab re-pept the datas (re'd 10/28/49)

noticed that the lab incarredly reputs the visual to have the lab revised (see page 30) was ; weed to have the lab revise the data sheet (received 10/28/94).

IVC. Example Sample Calculations

Review of one sample per data package is performed to determine if sample results and quantitation limits were correctly calculated and reported.

was selected for review in this data package. Sample ID: 50 70

Form 1 Review

- Were the Form 1s for completed according to the method/QAPP requirements? (Yes) No. If no, list 1. below the affected fields.
- 2. Reproduce the reporting limit for Pesticides/PCBs in one of the samples, did the laboratory correctly

Reproduce a calculation for one pesticide/PCB analyte in one of the samples that contained a positive result and compare the calculated result to the result reported by the laboratory.

CR J. NEH, IN120199 VAN at NEH, Inc 12/7/9	: G		Industri-Plex, Woburn, MA Organic Sedi(Data Dvaft Dv.												(
0 V D) I NEH INC 12/11	,			Olganio C	, our		^			_			0		4
Description:	SD-5DUP			SD-9	1	["	SD-8		1	SD-7	Γ	T	SD-6	1	
Lab_IO:	42583-4			42563-6		 -	42563-8	 	†	42563-11	 	 	42563-13	 	
Date:	06/22/99	Lab	DV	06/22/99	Lab	DV	06/22/99	Lab	DV	06/23/99	Lab	DV	06/23/99	Lab	DV
Units:	HO/KO dru s	Qual.	Qual.	HOKO LYUW	Qual.	Qual.	HOKO dryw	Qual.	Qual.	Harka drum		Qual.	pg/Kgdruu		
As received %solids:	9.99%	f	Bias	7.19%	1		17.04%		†	10.29%	1	-	18.38%		
Analyte Compaund	Field Dun	rate										1		 	1
Volatile Organic Analysis (VOC) My that \$2100 F	3		high					· · · · · · ·		1			1	-	
Chloromethane		U	w:	24	U	UJ ·	19	U	w٠	17	Ш	UJ ·	6	U	UJ .
Vinyl chloride		U	u	24	+	U	 	U	U		U	w.		U	w.
Bromomethane		+	U	24	+	U		U	U	17		W.	 	U	w.
Chloroethane	16	U	U	24	U	U	19	+	U	17	_	U	}	U	U
Acetone	2100	 	TBJ	Her) 470	+	TB	1400	 	ТВ	150	+	тв	31	+	ЛВ
1,1-Dichloroethene	 	U	U		U	υ	· · · · · · · · · · · · · · · · · · ·	U	U	-	U	U	 	U	U
Carbon disulfide	56		J K	24	U	U	13	J	J	20			17	,	<u> </u>
Methylene chloride	40	U	U	59	U	U	47	U	U	44	U	UJ.	16	U	w.
trans-1,2-Dichloroethene	16	U	u	24	U	υ	19	U	U	17		U	6	U	U
1,1-Dichloroethane	16	U	U	24	U	U	19	U	U	45	1	1	27	,	
2-Butanone (MEK)	490		J H	24	U	U	340			17	U	U		Ü	υ
cis-1,2-Dichloroethene	17		J	24	U	U	19	U	U	10	J	J	18	3	
Chloroform	16	J	υ·	24	U	U	19	U	U	17	U	U	ε	U	U
1,1,1-Trichloroethane	16	υ	Ų	24	U	U	19	U	U	17		U		U	U
Carbon tetrachloride	16	U	u	24	U	U	19	U	U	17		U		U	υ
Benzene	48000	E	J	41			9	J	1,		J	J	†	Ü	U
1,2-Dichloroethane	16	U	U	24	U	U	19	U	U	17	U	U	6	i U	Ū
Trichloroethene	10	J	y L	24	u	U	19	U	U	17	U	U	11		
1,2-Dichloropropane	16	υ	U	24	ū	U	19	U	U	17	U	υ		U	U
Bromodichloromethane	16	U	U	24	U	U	19	U	Ų	17	U	U		เป	U
Methyl isobutyl ketone (MIBK)	16	U	U	24	U	υ	19	U	U	17	U	U		ง	U
cis-1,3-Dichloropropene	16	U	υ	24	U	U	19	U	U	17	U	U		U	U
Toluene	45		J #	24	U	U	19	U	U	17	U	U		S U	U
trans-1,3-Dichloropropene	16	U	U	24	U	U	19	U	U	17	U	U		U	Ų
1,1,2-Trichloroethane	16	U	U	24	U	U	19	U	υ	17	U	U	(U	υ
2-Hexanone	16	U	U	24	U	U	19	U	υ	17	U	U	<u> </u>	U	U
Tetrachloroethene	16	υ	Ų	24	U	U	19	U	U	17	υ	U		U	U
Dibromochloromethane	16	U	U		U	U	19	U	U	17	υ	υ		U	U
Chlorobenzene	15	J	JH	24	U	υ	19	U	Ų	17	U	U		U	UJ i
Ethylbenzene	280		J H	24	U	υ	19	υ	U	17	U	υ		3 U	w,
p/m-Xylene	1400		J H	47	U	U	37	U	υ	35	U	U	13	3 U	U.
o-Xylene	220		J K	24	U	U	19	U	U	17	U	U	(U	W
Styrene	16	U	U	24	U	U	19	U	U	17	U	U		บ	W +
Bromoform	16	U	U	24	U	U	19	U	Ų	17	U	U	•	U	W
1,1,2,2-Tetrachloroethane	16	U	U	24	U	U	19	U	U	17	Ų	U	+	U	w

industri-Plex, Woburn, MA Organic Sediment Data

Draf + DV 10/26/99

Description:	SD-04			SD-12			SD-13			Trip Blank	1		SD-03		
Lab_ID:	42537-2			42537-5]	42537-7			42537-8			42541-2	_	
Date:	06/17/99	Lab	DV	06/17/99	Lab	DV	06/17/99	Ļab	DV	06/17/99	Lab	DV	06/18/99	Lab	DV
Units:	havea garant	Qual.		He/Ke dry	Qual.	Qual,	Harko druju	utual.	Qual.	HO/KO day w	Qual.	Qual.	Parka grant	Qual.	Qual
As received %solids:	13.23% ()		Ø 145	13.76%			27.04% V		845	0.00% NP			23.74%		B
Analyte		H	t hat						L= LON						人
Volatile Organic Analysis (VOC) Method 8260)	B		Ĵ											-	
Chloromethane	13	U	Ü	17	U	W ·	6	Ų	W in	2	U	U	7	υ	Ü
Vinyl chloride	13	U	U	17	U	U	6	U	UJ L	2	U	Ü	7	U	UJ
Bromomethane	13	U	UJ ·	84	U	w٠	31	U	UJ L	2	U	ΩJ	36	U	UJ ·
Chloroethane	13	U	U ·	17	U	U	6	U	NY T	2	U	U	1	U	w
Acetone	34	U	W ·	670		TB	290		JTB	4	J	J	210		JTB
1,1-Dichloroethene	13	U	U	17	U	U	е	U	UJ L	2	U	υ	7	U	IJ
Carbon disulfide	13	U	U	17	U	Ų	6	U	UJ L	2	U	U	7	U	IJ
Methylene chloride	34	JB	UJ ·	42	JB	U ·	15	JB	UJ Ł	5	U	W	7	JB	UJ ·
trans-1,2-Dichloroethene	13	U	U	17	U	U	6	Ų	m r	2	U	U	7	U	υJ
1,1-Dichloroethane	13	U	U	17	U	U	6	U	W	2	U	U	7	U	IJ
2-Butanone (MEK)	13	U	U	230			89	}	J	2	U	U	60		J
cis-1,2-Dichlorgethene	13	Ü	U	17	U	U	e	U	M L	2	U	U	7	U	ΟJ
Chloroform	34	JB	U	42	U	U	15	U	WL	1	J	J	18	U	UJ
1,1,1-Trichkoroethane	13	U	U	17	U	U	6	U	W L	2	U	U	7	U	IJ
Carbon tetrachloride	34	U	U	17	U	U	6	U	UJ L	2	U	Ü	7	U	υJ
Benzene	13	U	U	17	U	Ų	6	U	UJ L	2	U	U	7	U	IJ
1,2-Dichloroethane	13	U	Ü	17	U	Ü	6	U	W L	2	U	U	7	U	w
Trichloroethene	13	U	U	17	U	U	6	U	M L	2	U	υ	7	U	ŲĴ
1,2-Dichloropropane	15	U	U	17	U	U	6	U	UJ L	2	U	U	7	U	υJ
Bromodichloromethane	13	U	U	17	U	Ų	6	U	WL	2	U	U	7	U	IJ
Methyl isobutyl ketone (MIBK)	13	Ú	U	17	U	U		U	m r	2	U	U	7	U	UJ
cis-1,3-Dichloropropene		U	U	17	Ų	U	€	U	W L	2	U	U	7	U	UJ
Toluene	34	U	U	17	U	U	6	U	WL	2	U	U	7	U	UJ
trans-1,3-Dichloropropene		U	U	17	U	U	6	Ü	WL	2	U	U	7	U	UJ
1,1,2-Trichloroethane	_	U	U	17	U	U	E	J U	UJ L	2	U	U	7	U	IJ
2-Hexanone		U	U	17		U	6	U	wL	2	U	U	7	U	IJ
Tetrachloroethene		U	U	17		U	6	U	UJ L	2	Ū	U	7	U	ŊΊ
Dibromochloromethane		U	U	17		U	6	U	W L	2	U	U	7	U	เกา
Chlorobenzene		U	U	17	Ų	U	6	U	M L	2	U	υ	7	U	UJ
Ethylbenzene		U	U	17	U	U	6	U	UJ L	2	U	υ	7	U	υJ
p/m-Xylene	27	U	U	34	IJ	IJ	12	υ	W L	4	Ü	υ	15	U	IJ
p-Xylene	13	U	Ü	17	U	U	6	U		2	U	U	 	+	IJ
Styrene	13	U	U	17	U	U	6	U	+	2	U	U	+	 	UJ
Bromoform	13	U	U	17		U	 -	U		2	Ū	Ū			UJ
1,1,2,2-Tetrachioroe*	13	U	U	17		1		U		2	U	U	!	U	,

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Industri-Plex, Woburn, MA Organic Sedin Data

Draft DV 10/1-199

				4.9 4	1	-						•		,	
Description:	SD-2 (SD-07	1		SD-01		-	SD-10			SD-11			SD-5 (5D-	05)	
Lab_ID:	42562-2	,		42562-5		1	42562-7			42562-9			42563-2		
Date:	06/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/22/99	Lab	DV
Units:		Qual.	Qual.	HOKO dry wil	Qual.	Qual.	HONG drywt	Qual.	Qual.	HOKO dry w	Qual.	Quel.	HOKO dry w	Qual.	Qual.
As received %solids:	8.79%			23.80% J			22.47%			14.68%			10.98%		Bia
Analyte															Н:
Volatile Organic Analysis (VOC) Method 8240B															
Chloromethane	25	U	U	10	U	υ	10	U	U	14	U	U	18	U	IJ·
Vinyl chloride	25	U	U	10	U	U	10	U	U	14	U	U	17	J	JH
Bromomethane	25	Ų	υ	10	U	U	10	U	U	14	U	U	18	U	5
Chloroethane	25	U	U	10	U	u	10	U	U	14	U	U	18	U	ວ
Acetone	2200		ТВ	120		ТВ	58		TB	230		тв	2400	E	TBI
1,1-Dichloroethene	25	U	U	10	U	U	10	U	υ	14	U	Ų	18	Ų	U
Carbon disulfide	25	U	U	10	U	U	10	U	U	14	U	U	63		J H
Methylene chloride	63	U	U	24	U	U	24	U	U	34	U	U	44	U	U
rans-1,2-Dichloroethene	25	u	U	10	U	U	10	U	U	14	U	U	18	U	U
1,1-Dichloroethane	25	U	U	10	U	U	10	U	U	14	U	U	18	U	ر
2-Butanone (MEK)	680			10	U	U	10	U	U	14	U	υ	540		T
sis-1,2-Dichloroethene	25	U	U	10	U	U	10	U	U	14	U	u	54		JH
Chloroform	25	U	U	10	U	U	10	U	U	14	U	u	18	JB	د
1,1,1-Trichloroethane	25	U	u	10	U	U	10	U	U	14	U	U	18	U	υ
Carbon tetrachloride	25	U	U	10	U	υ	10	U	U	14	U	U	18	U	U
Benzene	25	u	υ	10	U	U	10	U	U	14	U	U	43000	E	J
1,2-Dichloroethane	25	U	U	10	Ų	U	10	U	U	14	U	U	18	U	U
Trichloroethene	25		u	10	U	U	10	U	U	14	U	U	22		J H
1,2-Dichloropropane	25	U	U	10	U	U	10	U	U	14	U	U	18	U	U
Bromodichloromethane	25	U	U	10	U	υ	10	υ	U	14	U	U	18	U	J
Methyl isobutyl ketone (MIBK)	25	U	u	10	U	υ	10	U	U	14	U	U	18	U	U
cis-1,3-Dichloropropene	25	υ	u	10	U	υ	10	U	Ų	14	υ	U	18	U	U
Toluene	25	U	U	10	υ	υ	10	U	u	14	U	U	140		J H
trans-1,3-Dichloropropene	25	U	บ	10	U	U	10	U	U	14	U	U	18	U	U
1,1,2-Trichloroethane	25	U	U	10	U_	U	10	U	U	14	U	U	18	U	U
2-Hexanone	25		U	10		U	• • • • • • • • • • • • • • • • • • • 	U	U	14	U	U	18	U	U
Tetrachloroethene	25		U		U	U		U	U	14	U	U	18		u
Dibromochloromethane	25	 	U	}	U	U		U	U		Ų	U	18	υ	U
Chlorobenzene	25		U	10	+	υ	• • • • • • • • • • • • • • • • • • • 	U	U	•	U	U	37	1	J H
Ethylbenzene	25	-	υ		U	U		U	U	14	U	U	710		JH
p/m-Xylene	50		U	19		U	19	U	U	27	' U	u	3400		J H
p-Xylene	25		u	10	U	U	10	U	U	14	U	U	370		J H
Styrene	25		U	10	U	U	10	U	U	14	U	U	18	U	U
Bromoform	25	·	U	10	U	U	10	U	U	14	U	U	18	U	U
1,1,2,2-Tetrachloroethane	25	ļu _	U	10	U	U	10	U	U	14	u	U	18	U	J

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NOR for NEH, Inc. 10/26/99

Industri-Plex, Woburn, MA Organic Sediment Data

Draft DV 10/26/99

SWC at NEH,	INC 12/9	717		ganic Sedin	HOIR D	ala					L	,
Description:	\$D-04			SD-12	3D-12					SD-03		
Lab_ID:	42537-1	}		42537-4			42537-6			42541-1		
Date:	06/17/99	Lab	DV	06/17/99	Lab	DV	06/17/99	Lab	DV	06/18/99	Lab	DV
Units:	HO/KO EM W	Qual.	Qual.	works dry st	Qual.	Qual.	HOKO drywi	Qual.	Qual.	HOKOLTH WE	Qual.	Qual.
Freeze-dried %solids:	66.97% U			83.57%			79.08%			77.74%	1	
Analyte Compounds												
Semi-Volatile Organic Analysis (SVOCs) 8270 L									Î		-	
bis(2-Chloroethyl)ether	400	U	U	320	U	U	330	U	Ü	340	IJ	U
Phenol	400	U	U	320	U	U	330	U	U	340		U
2-Chlorophenol	400	U	U	320	U	U	330	U	Ü	340	U	U
1,3-Dichlorobenzene	400	U	U	320	Ü	υ	330	u	U	340	U	U
1,4-Dichlorobenzene	400	U	U	320	U	U	330	U	U	340	 	U
1,2-Dichlorobenzene	400	Ü	U	320	U	U	330	U	U	340		U
bis(2-chloroisopropyl)ether	400	U	UJ ·	320	U	w,	330	U	w ·	340	U	UJ ·
Hexachloroethane	400	U	U	320	u	U	330	U	U	340	U	U
N-Nitroso-di-n-propytamine	400	U	W ·	320	Ü	nı ,	330	U	UJ ·	340	U	UJ ·
Nitrobenzene	400	U	U	320	U	U	330	U	U	340	U	U
Isophorone	400	U	U	320	U	U	330	U	U	340	U	U
2-Nitrophenol	400	U	U	320	Ų	U	330	U	U	340	U	U
2,4-Dimethylphenol	400	U	U	320	Ú	U	330	U	υ	340	U	U
bis(2-Chloroethoxy)methane	400	U	U	320	Ü	Ü	330	U	U	340	U	U
2,4-Dichiorophenol	400	U	U	320	٦	U	330	U	υ	340	U	U
1,2,4-Trichlorobenzene	400	U	v	320	C	U	330	U	U	340	U	U
Naphthalene	110	J	3 .	160	7	J ,	90	J	1 .	160	J	J .
Hexachlorobutadiene	400	u	U	320	J	U	330	u	U	340	U	U
4-Chloro-3-methylphenol	400	U	U	320	U	U	330	U	u	340	U	Ū
Hexachlorocyclopentadiene	990	U	w,	790	U	w .	840	U	W ·	850	 	UJ
2,4,6-Trichlorophenol	400	U	U	320	U	U	330	Ú	Ū	340	 	U
2-Chloronaphthalene	400	U	U	320	υ	Ü	330	U	U	340		U
Acenaphthylene	200	J	J	190	J	J	110	J	J ·	390		†
Dimethylphthatate	400	U	U	320	U	U	330	U	U	340		U
2,6-Dinitrotoluene	400	U	U	320	U	U	330	U	U	340	U	U
Acenaphthene	400	U	U	81	J	Ĵ,	100	J	J ·	110	J	J '
2,4-Dinitrophenol	990	U	w.	790	U	w ·	840	U	UJ (850		W
2,4-Dinitrotoluene	400		υ	320	υ	U	330	U	U	340		Ü
4-Nitrophenol	990	U	UJ ·	790	U	'n۱	840	U	UJ ,	850		IJ,
Fluorene	160	J	J	190	J	J ·	120	J	J .	210	+	J
4-Chlorophenyl-phenylether	400	U	υ	320	U	U	330	U	υ	340		Ū
Diethylphthalate	400	U	U	320	U	U	330	U	U	340		U
4,6-Dinitro-2-methylphenol	990		UJ 1	790	U	w ·		U	m ·	850		W ·
n-Nitrosodiphenylamine	400		U	320	U	Ü	330	Ü	U	340		U

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Industri-Plex, Woburn, MA Organic Sedi(Data

Description:	SD-04	·····					SD-13		Ţ	SD-03		
Lab_ID:	42537-1			42537-4			42537-6		 	42541-1		+
Date:	06/17/99	Lab	DV	06/17/99	Lab	DV	06/17/99	Lab	Val	06/18/99	Lab	DV
Units:	חם/עם קעט אין	Qual.	Qual.	Harka dru w	Qual.	Qual.	po/Ka druw	Qual.	Quai.	HO/KO druw		Qual.
Freeze-dried %solids:	66.97% (Bias	83.57%			79.08%			77.74%		1
4-Bromophenyl-phenylether	400	U	U	320	U	υ	330	U	U	340	U	U
Hexachlorobenzene	400	U	U	320	Ų	U	330	U	U	340	U	U
Pentachlorophenol	990	U	UJ IM	790	Ü	עט למין	840	U	UJ (W)	850	U	UJ joj
Phenanthrene	1600			1500	٠		2000		1	3300	-	
Anthracene	320	J	J v	380		<u> </u>	330		1	440		1
Di-n-butylphthalate	400	U	U	320	U	U	330	U	U	340	U	U
Fluoranthene	3700		Î	3100			4700			6400	D	1
Рутеле	3400			2900			4100			6100	+	
Butylbenzylphthaiate	400	U	U	320	U	U	140	j	J ·	340	U	U
3,3'-Dichlorobenzidine	400	U	U	320	U	u	330	U	U	340		U
Benzo[a]anthracene	1500			1400			1700		f	2100		†
Chrysene	2600		<u> </u>	2100	-		3000		†	4400		
bis(2-Ethylhexyl)phthalate	180	J	J ,	100	J	J.	580			1200		1
Di-n-octytphthalate	400	U	U	320	J	U	330	U	U	340	U	Ü
Benzo[b]fluoranthene	3000			2100			3800		1	4900		
Benzo[k]fluoranthene	2200			2000			2300		 	3200		1
Benzo[a]pyrene	2100			1900			2600		1	3300		
Indeno[1,2,3-cd]pyrene	1800			1400			2200			2400	 	1
Dibenz[a,h]anthracene	350	J	J ·	320			530		1	530		1
Benzo[g,h,i]perylens	1400			1100		_	1500		1	1700		
2-Methylphenol	400	U	U	320	Ų	U	330	U	U	340	U	U
4-Methylphenol	400	Ų	U	320	U	U	330	Ü	Ú	340	·	υ
4-Chloroaniline	400	บ	U	320	U	U	330	U	U	340	U	Ū
2-Methylnaphthalene	400	U	u	81	J	J.	330	U	Ü	93		J .
2,4,5-Trichlorophenol	990	U	U	790	U	U	840	U	U	850	U	U
2-Nitroaniline	990	U	U	790	U	U	840	U	U	850		Ū
3-Nitroaniline	400	U	u	320	U	U	330	U	Ū	340		υ
Dibenzofuran	120	J	J .	120	J	J	330	U	U	120	-	J .
4-Nitroaniline	990	U	U	790	U	U	840	U	Ų	850		U
Carbazole	220	J	J .	170	j	J .	320	j	J	370		1

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Industri-Plex, Woburn, MA Organic Sediment Data

Description:	(SD-2) 5D	-02		SD-01			SD-10			SD-11		
Lab_ID:	42562-1			42562-4			42582-6			42562-8		
Date:	06/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV
Units:	parka dry at	Qual.	Qual.	HOKO dyum	Qual.	Qual.	HO/KO CYU W	Qual.	Qual.	HOKO druw	Qual.	Qual.
Freeze-dried %solids:	92.31% ()			86.99%			78.71%			81.27%		
Analyte						1						
Semi-Volatile Organic Analysis (SVOCs)												
bis(2-Chloroethyl)ether	1000	Ü	U	300	U	U	340	U	Ū	330	U	lu
Phenol	1000	U	U	300	U	u	340		U	330		U
2-Chlorophenol	1000	U	v	300	U	U	340		U	330		Ū
1,3-Dichlorobenzene	1000	υ	U	300	U	U	340		Ū	330		Tu Tu
1,4-Dichlorobenzene	1000	U	U	300	υ	U	340		Ū	330		U
1,2-Dichlorobenzene	1000	U	U	300		U	340		Ü	330		U
bis(2-chloroisopropyl)ether	1000	U	UJ .	300	 	υ,	340		ŪJ ,	330	 	w
Hexachloroethane	1000	U	U	300		υ	340	}	U	330		U
N-Nitroso-di-n-propytamine	1000	U	UJ ·	300	U	U.J	340	 	uu i	330	-	w
Nitrobenzene	1000	U	U	300	U	υ	340		U	330		υ
Isophorone	1000	U	U	300		υ	340		Ū	330		U
2-Nitrophenol	1000	U	U	300	U	U	340	 	U	330		Ū
2,4-Dimethylphenol	1000	U	υ	300	u	U	340		U	330		U
bis(2-Chloroethoxy)methane	1000	u	U	300		U	340		lu	330		lυ
2,4-Dichlorophenol	1000		U	300	U	υ	340	t	U	330	 	U
1,2,4-Trichlorobenzene	1000	U	U	300	U	u	340		Ū	330		U
Naphthalene	1000	U	U	300	U	U	340		υ	120		J,
Hexachlorobutadiene	1000	บ	Ū	300	U	U	340		Ū	330	U	U
4-Chloro-3-methylphenol	1000	U	Ü	300	U	U	340	 	U	330	-	<u>י</u> טר
Hexachlorocyclopentadiene	2600	U	w,	760	U	m,	840	U	m,	810		w
2,4,8-Trichlorophenol	1000	U	u	300	U	U	340	U	U	330		U
2-Chioronaphthalene	1000	U	U	300	U	υ	340		U	330		Ū
Acenaphthylene	1000	U	U	150	J	J 、	340		Ü	98		J
Dimethylphthalate	1000	Ų	U	300	U	U	340		U	330		U
2,6-Dinitrotoluene	1000	U	u	300	U	U	340		Ū	330		U
Acenaphthene	1000	U	Ü	300	U	U	340		Ū	240		J
2,4-Dinitrophenol	2600	U	nn •	760	U	W ·	840		nı ,	810		w
2,4-Dinitrotoluene	1000	U	U.	300	u	υ	340		U	330		U
4-Nitrophenol	2600	U	w ·	760		u,	840		w ·	810		W
Fluorene	1000	+	U	300	+	Ü	340		U	370		1
4-Chlorophenyl-phenylether	1000		Ū	300		u	340		U	330		U
Diethylphthalate	1000	}	Ū	300		U	340		U	460		厂
4,6-Dinitro-2-methylphenol	2600	+	w ·	760		m,	840	 	w ·	810		W
n-Nitrosodiphenylamine	1000	+	U	300	· · · · · · · · · · · · · · · · · · ·	U	100		J .	170		J.

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Industri-Plex, Woburn, MA Organic Sedir Data

Draft	DV	1- 26/89
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Description:	SD-2) 5D	-02		SD-01			SD-10		ļ	SD-11		1
Lab ID:	42562-1		-	42562-4			42562-6		 	42562-8		
Date:	06/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV	06/21/99	Lab	DV
Units:	ua/Ko drum	Quel.	Qual.	HOKO OYUN	Qual	Qual.	parka drust	Qual.	Qual.	HO/KO druit		Qual.
Freeze dried %solids:	92.31% U		Bras	86.99%			78.71%			81.27%		
4-Bromophenyi-phenylether	1000	U	U	300	U	U	340	U	U	330	U	U
Hexachlorobenzene	1000	Ü	υ	300		U	340		U	330		Ū
Pentachlorophenol	2600	U	(עסג נט	760	Ü	UJ /ON	840	U	UJ Jan	810		UJ LON
Phenanthrene	1000	Ų	U	850			530		1311	7000	D	1
Anthracene	1000	U	U	150	J	J ·	340	U	u	590		
Di-n-butylphthalate	1000	υ	U	300	U	u	340	U	U	330	U	U
Fluoranthene	1000	C	U	1500		† 	1500			16000	D	
Pyrene	1000	C	U	1700			1300			14000		
Butylbenzylphthalate	1000	J	U	300		υ	340	U	U	330	U	U
3,3'-Dichlorobenzidine	1000	U	U	300	U	U	340	U	U	330		U
Benzo[a]anthracene	1000	c	Ü	640		 	460			4000		
Chrysene	1000	U	U	1100			960			9900	D	
bis(2-Ethythexyl)phthalate	1000	5	Ü	94	J	J .	540			1100		
Di-n-octylphthalate	1000	c	Ü	300	U	Ú	340	Ų	U	330	U	U
Benzo[b]fluoranthene	1000	J	٦	920	····	1	1100			10000	D	
Benzo[k]fluoranthene	1000	U	Ü	840		1	910			5900		
Benzo[a]pyrene	1000	C	U	810		<u> </u>	690			7200	D	
Indeno[1,2,3-cd]pyrene	1000	U	U	530			560			4900		
Dibenz[a,h]anthracene	1000	U	U	110	J	٠ ر	110		J .	1200		
Benzo[g,h,i]perylene	1000	U	U	500			480			3700		
2-Methylphenol	1000	U	ت	300	U	U	340	U	U	330	U	U
4-Methylphenol	1000	U	U	190	j	J .	340		U	330	-	U
4-Chloroaniline	1000	Ų	U	300	U	U	340	-	U	330		U
2-Methylnaphthalene	1000		U	300		Ū	340		Ū	330		Ü
2,4,5-Trichlorophenol	2600		U	760		U	840		Ü	810		U
2-Nitroaniline	2600	U	U	760		U	840		U	810		U
3-Nitroaniline	1000	U	U	300	U	U	340		U	330		U
Dibenzofuran	1000	U	U	300	U	U	340		Ü	240		J .
4-Nitroaniline	2600	U	U	760		U	840	 	u	810		U
Carbazole	1000	U	U	300	U	Ū	340		U	970		† <u>-</u>

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Industri-Plex, Woburn, MA Organic Sediment Data

Draft DV 10/26/99

<u> </u>		,		gaine seen								,
Description:		-05	ļ <i>l</i>	SD-5 (Dup)	105D4	P (-09	7	SD-8 5 D	-08	
Lab_ID:	42563-1		ļ`	42563-3			42563-5			42563-7		
Date:	06/22/99	Lab	DV	06/22/99		DV	06/22/99	Lab	DV	06/22/99	Lab	DV
Units:	HOKO dryw	Qual.	Qual.	HOKO dyu J	Qual.	Qual.	harka Chin	Qual.	Qual.	HOKO GINUT	Qual.	Qual.
Freeze-dried %solids:	97.31% <i>(</i> /		<u> </u>	55.07% U			41.72% U			78.04% U		
Analyte				Field bu	olicate							
Semi-Volatile Organic Analysis (SVOCs)										-		
bis(2-Chloroethyl)ether	810	U	U	1900	U	U	640	U	u	340	U	U
Phenol	340	J	1 .	760	JD	J ,	640	U	U	120	J	J ·
2-Chlorophenol	810	U	U	1900	U	u	640	U	U	340	u	U
1,3-Dichlorobenzene	810	U	U	1900	U	U	640	U	υ	340		Ū
1,4-Dichlorobenzene	810	U	U	1900	U	U	640	Ų	U	340	υ	U
1,2-Dichlorobenzene	810	U	U	1900	U	U	640	U	υ	340		U
bis(2-chloroisopropyl)ether	810	U	UJ .	1900	U	w .	840		UJ ·	340		w .
Hexachloroethane	810	U	u	1900	U	U	640		U	340		U
N-Nitroso-di-n-propytamine	810	U	m,	1900	U	UJ .	640		W ·	340		w ·
Nitrobenzene	810	U	U	1900	U	U	640	U	υ	340		U
Isophorone	810	υ	υ	1900	U	υ	640	U	υ	340	U	U
2-Nitrophenol	810	U	U	1900	υ	U	640	U	υ	340	U	U
2,4-Dimethylphenol	810	U	U	1900	U	U	640	υ	U	340	U	υ
bis(2-Chloroethoxy)methane	810	U	U	1900	U	υ	640	U	U	340	U	U
2,4-Dichlorophenol	810	U	U	1900	U	U	640	U	U	340		U
1,2,4-Trichlorobenzene	810	U	U	1900	U	Ü	640		U	340		U
Naphthalene	550	J	1 .	1100	JD	J ,	640	U	υ	190	J	j
Hexachlorobutadiene	810	IJ	U	1900	U	Ü	640		U	340		U
4-Chloro-3-methylphenol	810	U	U	1900	U	Ų	640	U	U	340		lu
Hexachlorocyclopentadiene	2000	U	w·	4800	U	w ·	1600	-	w ·	850		w
2,4,6-Trichlorophenol	810	+	U	1900		U	640	 	U	340		U
2-Chloronaphthelene	810	†	u	1900		U	640		U	340		u
Acenaphthylene	810		Ū	1900	 	Ü	640	-	U	340	 	Ū
Dimethylphthalate	810	U	U	1900	+	Ū	640		U	340	 	U
2,6-Dinitrotoluene	810	Ų	u	1900	U	U	640		U	340		U
Acenaphthene	390	J	J -	1200	+ · · · · · · · · · · · · · · · · · · ·	J .	640	•	υ	130	 	J
2,4-Dinitrophenol	2000	U	m ·	4800		w,	1600		w ·	850		UJ ·
2,4-Dinitrotoluene	810	U	U	1900	U	U	640	,	U	340		U
4-Nitrophenol	2000		w	4800		ω ·	1600		υj '	850	, 	m ,
Fluorene	680	+	J ·	2000		J .	640		U	240	:	J ·
4-Chlorophenyl-phenylether	810		Ū	1900		U	640		U	340		U
Diethylphthalate	810	 	Ū	1900		u	640		U	340		U
4,6-Dinitro-2-methylphenol	2000		w.	4800		u, tu	1600		m ,	850	1	u,
n-Nitrosodiphenylamine	810		U	1900		U	640		U	340		03 ,

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Ĺ				stri-Plex, V ganic Sedir	,	, MA ata						raft
Description:	(SD-5) 51	1-05	[(SD-5 (Dup)	5D 050	VP 1	SD-9) 5	D-09	(SD-8) 5	D-08	7
Lab_1D:	42563-1			42563-3	1	1	42563-5		,	42563-7		
Date:	06/22/99	Lab	DV	06/22/99	Lab	DV	06/22/99	Lab	DV	06/22/99	Lab	νם
Units:	μα/Κο ζίνων	Qual.	Qual.	אסיאם ליייון	Qual.	Qual.	HO/KO dywy	Qual.	Qual.	HONE GAME	Qual.	Qual.
Freeze-dried %solids:	97.31% J		805	55.07% U		I	41.72% U			78.04% J		
4-Bromophenyl-phenylether	810	υ	U	1900	U	υ	640	U	U	340	U	U
Hexachlorobenzene	810	U	U	1900	U	U	540	U	U	340	U	Ü
Pentachlorophenol	2000	U	ON TOW	4800	IJ	المل لك	1600		W LON		+	ע נט
Phenanthrene	5900		J ·	15000	D	J ·	760			2000		
Anthracene	640	J	J	1800	JD	j ,	640	U	U	220	J	J ,
Di-n-butylphthalate	810	U	U	1900	U	U	640		U	340	 	u
Fluoranthene	12000		J .	26000	D	J,	2300	1		3900	ol .	
Pyrene	7900		J,	19000	D	J '	1900			3000	1	
Butylbenzylphthalate	810	U	υ	1900	บ	U	640	U	U	340	U	Ū
3,3'-Dichlorobenzidine	810	U	U	1900	U	U	640		U	340	U	U
Benzo[a]anthracene	3100		J ·	6600	D	J,	750			1100		
Chrysene	6500		J ·	14000	D	J	1500			2200	1	
is(2-Ethylhexyl)phthalate	3700			4500	D	1	1500			1000	1	
Di-n-octylphthalate	810	Ų	U	1900	U	u	640		U	340	Ü	Ü
Senzo(b)fluoranthene	6400		J ·	14000	D	J ·	1500			2200		
lenzo[k]fluoranthene	5600		J .	11000	D	j,	1500			1800	 	
Benzo(a)pyrene	3700	1	J .	9300	· · · · · · · · · · · · · · · · · · ·	J .	1100			1400	 	
ndeno[1,2,3-cd]pyrene	3100	<u> </u>	J ,	7300	D	J ,	850	 		1200		
Dibenz[a,h]anthracene	670	J	J ,	1500	JD	J ·	180	J	J ,	220	 	J ·
Benzo[g,h,i]perylene	2300	1	J .	5900	D	J ,	720			940		
2-Methylphenol	230		J ·	530	JD	J ,	640		U	340	<u> </u>	Ü
-Methylphenol	810	+~	Ü	1900		U	640		u	340		Ü
-Chloroaniline	810		U	1900		U	640	-	U	340	}	Ū
-Methylnaphthalene	810	 	U	1900	Ü	U	640		U	340		Ü
,4,5-Trichlorophenol	2000	+	u	4800		U	1600		บ	850		Ū
-Nitroaniline	2000		U	4800		U	1600		Ū	850		U
3-Nitroandine	810		U	1900		Ū	640		Ū	340	+	u
Dibenzofuran	460	J	J ·	1200		J ,	540		Ū	150	 	J .
1-Nitroanitine	2000	U	U	4800	U	U	1600		v	850	 	U
Carbazole	1100		J .	3100	D	J	640	<u> </u>	U	400	+	<u> </u>

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Description:	(SD-7) S	007		SD-6	D-0	6	
Lab_ID:	42563-10			42563-12	-		
Date:	06/23/99	Lab	DV	06/23/99	Lab	DV	
Units:	Ha/Ka dry NT	Qual.	Qual.	HOKO OVUM	Qual.	Qual.	
Freeze-dried %solids:	61.11%			87.68% /			
Analyte			1				
Semi-Volatile Organic Analysis (SVOCs)			Ì				
bis(2-Chloroethyl)ether	430	U	U	300	U	U	
Phenol	430		U	300		U	
2-Chlorophenol	430	· · · · · · · ·	Ū	300		U	
1,3-Dichlorobenzene	430		u	300		U	
1,4-Dichlorobenzene	430	 	Ū	300		U	}
1,2-Dichlorobenzene	430	+	υ	300		υ	
bis(2-chloroisopropyl)ether	430		w 1	300		w .	
Hexachloroethane	430		U	300		U	
N-Nitroso-di-n-propytamine	430	· -	w ·	300		w ,	. –
Nitrobenzene	430	, 	U	300		U	
Isophorone	430		Ü	300		U	
2-Nitrophenol	430		U	300		U	
2,4-Dimethylphenol	430	 	Ū	300		U U	
bis(2-Chloroethoxy)methane	430		υ	300		U	<u></u>
2,4-Dichlorophenol	430		υ	300		U	
1,2,4-Trichlorobenzene	430	 -	Ü	300		Ü	
Naphthalene	430	 	υ	110	-	J ,	<u>. </u>
Hexachlorobutadiene	430		Ū	300		U	
4-Chloro-3-methylphenol	430		v	300		Ü	
Hexachlorocyclopentadiene	1100		UJ ,	760	-	w ·	
2,4,6-Trichlorophenol	430	 	U	300		Ü	
2-Chloronaphthalene	430	-	U	300		U	
Acenaphthylene	430		U	80		J	
Dimethylphthalate	430		U	300		υ	
2,6-Dinitrotokuene	430	 	U	300		U	
Acenaphthene	150	-	J .	300		U	<u> </u>
2,4-Dinitrophenol	1100		w .	760		DJ (
2,4-Dinitrotoluene	430	 	u ·	300		U	
4-Nitrophenol	1100		w ·	760		m ,	-
Fluorene	330		J ·	300		U	
4-Chlorophenyl-phenylether	430		u	300		υ	
Diethylphthalate	110]	300		U	
4,6-Dinitro-2-methylphenol	1100	+	nn ,	760	 	UJ O	
n-Nitrosodiphenylamine	150		J .	150		3	•

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Industri-Plex, Woburn, MA Organic Sedi/ Data

Description:	(SD-7) 5.	D-07		SD-6	5D	106
Lab_ID:	42563-10			42563-12		
Date:	06/23/99	Lab	DV	06/23/99	Lab	DV
Units:	μg/Kg	Qual.	Qual.	ug/Kg	Qual.	Quel.
Freeze-dried %solids:	61.11% dV./ k	rt	Bus	87.68% dyu	o l	
4-Bromophenyl-phenylether	430	ŭ	U	300	U	υ
Hexachlorobenzene	430	IJ	U	300	U	U
Pentachlorophenol	1100	U	עם בע	760	υ	W LOK
Phenanthrene	4100		,	1000		
Anthracene	410	J	J	260	J	J
Di-n-butylphthalate	430	U	U	300	U	U
Fluoranthene	8300	D		3400		
Pyrene	6500			2600		
Butylbenzylphthalate	430	U	U	300	υ	U
3,3'-Dichlorobenzidine	430	U	U	300	U	υ
Benzo(a)anthracene	2200			1300		
Chrysene	4900			1800		
bis(2-Ethylhexyl)phthalate	2600		1	37000	D	
Di-n-octylphthalate	430	J	U	300	υ	U
Benzo[b]fluoranthene	5500			2100		
Benzo[k]fluoranthene	3400			1700		
Benzo[a]pyrene	3000			1400		
Indeno[1,2,3-cd]pyrene	2400			940		
Dibenz[a,h]anthracene	470			210	J	J ,
Benzo[g,h,i]perylene	1700			760		
2-Methylphenol	430	ت	υ	300	U	υ
4-Methylphenol	430	ت	U	300	U	U
4-Chloroaniline	430	U	υ	300	U	U
2-Methylnaphthalene	430	U	u	300	U	Ü
2,4,5-Trichlorophenol	1100	U	บ	760	U	U
2-Nitroaniline	1100	U	U	760	U	U
3-Nitroaniline	430		U	300		υ
Dibenzofuran	170		J	300	 	U
4-Nitroaniline	1100		U	760	U	U
Carbazole	670		 	160		

NOR JU NEH, Inc. 10/25/99 V Duc et NEH, Inc. 12/7/99

Industri-Plex, Woburn, MA Organic Sediment Data

Draft DV 10/26/99

Description:	SD-04			SD-12			SD-13			SD-03		7	SD-2) 51	5-03	1
Lab_ID:	42537-1			42537-4			42537-6			42541-1			42562-1		+
Date:	06/17/99	Lab		06/17/99	Lab	DV	06/17/99	Lab	OV	06/18/99	Lab	ĐV	06/21/99	Lab	OV
Units:	Harke drive	Qual.	Quel.	μ g/Kg αν _{ιλιή}	Qual.	Qual.	Harks arya	Qual.	Qual.	HOKO drugt	Qual.	Qual.	Ha/Kadyu wi	Qual.	Qual.
Freeze-dried %solids:	66.97%			83.57% (79.08%			77.74%			92.31%		1
Analyte															
Pesticides/ PCBs fut 8081A + 8082															1
Alpha-BHC	0.99	U	U	0.79	U	U	0.84	U	Ų	0.85	Ü	U	2.6		Ü
Gamma-BHC	0.99	U	U	0.79	U	U	0.84	U	บ	0.85	U	W ·	2.6		U
Beta-BHC	0.99	U	U	0.79	υ	U	0.84	U	U	0.85	Ū	U	2.6		U
Delta-BHC	0.99	U	υ	0.79	υ	U	0.84	U	U	0.85	U	U	2.6		U
Heptachlor	0.99	U	Ü	0.79	U	U	0.84	u	U	0.85	U	u	2.6		u
Aldrin	0.99	U	U	0.79	Ų	U	0.84	U	U	0.85	ū	ע נט			u
Heptachlor Epoxide	0.99	U	U	0.79	U	Ų	0.84	υ	U	0.85	U	u	2.6	บ	U
Gamma Chiordane	0.99	U	υ	0.79	U	U	0.84	U	U	0.85	Ū	U	2.6		U
Alpha Chlordane	0.99	U	U	0.79	U	Ū	0.84	υ	U	69	E	J 74;	da 2.6	Ų	u
Endosulfan I	0.99	U	U	0.79	U	U	0.84	υ	U	0.85	Ü	U	2.6		u
4,4'-DDE	0.99	U	U	0.79	U	U	17			43	E		13		Ť
Dieldrin	0.99	U	U	0.79	Ū	υ	0.84		υ	0.85	<u> </u>	U	2.6	U	U
Endrin	0.99	U	U	0.79	Ü	Ü	0.84	Ų	U	0.85		UJ I	w 2.6		Ū
4,4'-DDD	27			8.0	 	1	22			97		 	25		+
Endosulfan li	0.99	U	U	0.79	Ų	U	0.84		U	0.85		U	2.6		U
4,4'-DDT	0.99	U	U	0.79		U	13			26	 	J Hi			U
Endosulfan Sulfate	0.99	<u> </u>	U	0.79		U	0.84		U	0.85		U '	2.6		U
Methoxychlor	4.9		U	4.0		U	4.2	·	U	4.2		U	13		Ü
Endrin Ketone	0.99		U	0.79	l -	U	0.84		U	0.85		u	2.6		U
Toxaphene	9.9		U	7.9		u -	8.4		U	8.5		u	26		u
						 			-			-	 		+
Arodor 1016	3.9	U	U	3.2	U	u	3.3	Ü	u	3.4	U	u	10.4		tu
Arodor 1221	3.9	U	U	3.2	L.	U	3.3	-	U	3.4		u	10.4		Ū
Arodor 1232	3.9		υ	3.2		Ū	3.3		U	3.4		U	10.4		u
Aroclor 1242	3.9	U	U	3.2		U	3.3		U	3.4		Ū	10.4		Ū
Aroclor 1248	3.9		u	3.2	L	U	3.3		Ū	3.4	 	u	10.4		lu -
Aroclor 1254	3.9	<u> </u>	U	3.2		U -	3.3		u	3.4		u	10.4		U
Aroclor 1260	3.9		u	3.2		u	3.3		lu	3.4		u	10.4		lu

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Industri-Piex, Wopum, MA Organic Sediment Data

Description:	SD-01			SD-10			SD-11		1 7	SD-5) 5D	-05	/	SD-5 (dup)	30-	05 D
Lab_ID;	42562-4			42582-6			42562-8		 	42563-1			42563-3	 	<u> </u>
Date:	06/21/99	Lab	DV	06/21/99	Lab	D۷	06/21/99	Lab	DV	06/22/99	Lab	DV	06/22/99	Lab	DV
Units:	Ha/Ka dr. wo	Qual.	Qual.	pg/Kg dryi	Qual.	Qual.	HOKO YYUU	Qual.	Qual.	Hg/Kg dryl	Qual.	Qual.	HOKO CITUTA	<u> </u>	Qual.
Freeze-dried %solids:	86.99% <i>(</i>			78.71% Ü			81.27%			97.31%			55.07%		
Analyte			BAA	/									Field Du	nlva	7/
Pesticides/ PCBs								1					1	7	
Alpha-BHC	0.76	Ų	Ù	0.84	U	u	0.81	U	U	2.0	U	Ü	1.2	Ū	U
Gemma-BHC	0.76	Ū	U	0.84	U	U	0.81	U	U	2.0	U	U	1.2	U	U
Bets-BHC	0.76	U	U	0.84	U	U	0.81	U	υ	2.0	U	U	1.2	U	υ
Delta-BHC	0.76	U	U	0.84	U	U	0.81	U	Ü	2.0	Ų	Ü	1.2	U	U
Heptachlor	0.76	Ū	U	0.84	U	U	0.81	υ	U	2.0	U	U	1.2	U	U
Aldrin	0.76	U	U	0.84	U	U	0.81	U	U	2.0	U	U	1.2		U
Heptachlor Epoxide	0.76	u	U	0.84	U	U	0.81	υ	U	2.0	U	υ	1.2	U	υ
Gamma Chlordane	0.76	U	υ	0.84	U	U	0.81	U	U	2.0	U	U	1.2		υ
Alpha Chlordane	23	U	J H	n 0.84	U	Ū	0.81	U	U	2.0	U	U	1.2	U	lu
Endosulfan I	0.76	U	U	0.84	U	U	0.81	U	U	2.0	U	U	1.2		U
4,4'-DDE	470	E		2.7			0.81	U	U	2.0	U	U	1.2	U	U
Dieldrin	0.76	Ü	U	0.84	U	Ü	0.81	IJ	U	2.0	U	U	1.2	U	U
Endrin	0.76	U	U	0.84	U	U	0.81	U	U	2.0	U	υ	1.2	U	U
4,4'-DDD	200	E		3.2		1	0.81	U	U	2.0	U	U	1.2	U	U
Endosulfan II	0.76	U	Ų	0.84	U	υ	0.81	U	υ	2.0	U	U	1.2	U	U
4,4'-DDT	180	Ε		0.84	U	U	0.81	U	U	2.0	U	U	1.2	U	U
Endosulfan Sulfate	0.76	U	U	0.84	U	U	0.81	IJ	U	2.0	U	Ü	1.2	U	U
Methoxychlor	3.8	U	U	4.2	U	U	4.1	U	U	10	U	U	6.0	U	U
Endrin Ketone	0.76	U	U	0.84	U	U	0.81	บ	U	2.0	U	U	1.2	U	U
Toxaphene	7.6	U	Ü	8.4	U	U	8.1	υ	U	20	u	U	12	U	U_
Aroclor 1016	3.0		U	3.4		U	3.3		U	8.1	U	Ü	4.8	U	U
Aroclor 1221	3.0	_	υ	3.4		U	3.3		U	8.1		U	4.8	U	U
Aroclor 1232	3.0		U	3.4		U	3.3		U	8.1		U	4.8	-	υ
Aroclor 1242	3.0	υ	U	3.4	,	U	3.3		U	8.1	U	U	4.8	U	U
Aroclar 1248	3.0		U	3.4	U	U	3.3	U	U	8.1	U	Ų	4.8	U	U
Aroclor 1254	3.0	U	U	3.4	U	Ü	3.3	υ	U	8.1	U	υ	4.8	u	U
Aroclor 1260	3,0	U	U	3.4	U	U	3.3	U	U	8.1	U	U	4.8	U	u

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DraftDV 10/26/79

industri-Plex, Woburn, MA Organic Sediment Data

Description:	SD-9			SD-8			SD-7			SD-6		
Lab_ID:	42563-5			42563-7			42563-10			42563-12		
Date:	08/22/99	Lab	DV	06/22/99	Lab	OV	06/23/99	Lab	DV	06/23/99	j_ab	DV
Units:	po/Kadru ict	Qual.	Qual.	vorke druw	Qual.	Quel.	haka MMM	Quel.	Quel.	HONE ONNE	Qual.	Qual.
Freeze-dried %solids:	41.72% (<u> </u>	78.04%			61.11%			87.68%		
Analyte												Bi
Pesticides/ PCBs												
Alpha-BHC	1.6	U	U	0.85	U	U	1.1	U	U	7.6	U	Ü
Gamma-BHC	1.6	U	U	0.85	U	U	1.1	u	U	7.6	U	U
Beta-BHC	1.6	U	U	0.85	U	U	1.1	U	U	7.6	U	U
Delta-BHC	1.6		υ	0.85	U	U	1.1	U	U	7.6	U	U
Heptachlor	1.6	L	U	0.85	U	U	1.1	U	U	7.6	U	U
Aldrin	1.8		U	0.85		U	1.1	U	U	7.6	U	U
Heptachlor Epoxide	1.6		U	0.85		U	1.1	U	U	7,6		U
Gamma Chlordane	1.6		U	0.85		U	1.1	U_	U	93	Ρ	J His
Alpha Chlordane	1.6	<u> </u>	U	0.85		U	1.1	U	U	92		」(十)
Endosulfan I	1.6		U	0.85		U	1.1	U	U	7,6		υ
4,4'-DDE	1.6		U	0.85		u	1.9	U	U	7,6	<u></u>	U
Dieldrin	1.6		U	0.85	<u> </u>	U	1.1		u	7,6		U
Endrin	1.6		U	0.85		U	1.1		U	7.6	1	U
4,4'-DDD	1.6		U	0.85		U	1.1	U	U	22	P	J H
Endosulfan II	1.6		U	0.85		U_	1.1		U	7.6		U
4,4'-DDT	1.6		U	0.85		U	1.1		U	7.6		U
Endosulfan Sulfate	1.6	L	U	0.85		U	1.1	U	Ų.	7.6	U	U
Methoxychior	8.0		U	4.3		U	5.4		U	38		w
Endrin Ketone	1.6		U	0.85		U	1.1		U	7.6	U	U
Toxaphene	16	U	U	8.5	U	v	11	U	U	76	U	U
1010						<u> </u>			ļ	<u> </u>		<u> </u>
Aroclor 1016	6.4		<u>U</u>	3.4	-	U	4.3		U	3.0		υ
Aroclor 1221	6.4		<u>u</u>	3.4		U	4.3		υ	3.0		U
Aroclor 1232	6.4		U.	3.4		<u>U</u>	4.3		v	3.0		U
Aroclor 1242	6.4		<u>lu</u>	3.4		U	4.3		U	3.0		U
Arador 1248	6.4	 _	U	3.4		U	4.3		U	3.0		Ų
Arodor 1254	6.4	<u> </u>	U	3.4		lu	4.3		υ	3.0		U
Aroclor 1260	6.4	U	խ	3.4	U	U	4.3	U	լս	3.0	U	U

pag 303

Data Usability Review Organic Analysis by Modified Method 8270C EPA Region I Tier II - type review

Client:

Menzie-Cura & Associates, Inc.

Site:

Industri-Plex, Woburn, Massachusetts

Laboratory:

Woods Hole Group Environmental Laboratory, Raynham, MA

SDG: ETR 42693

of samples/Analyses:

11 benthic invertebrates for Polynuclear Aromatic Hydrocarbon analysis

Initial Reviewer: Dr. Nancy C. Rothman, New Environmental Horizons, Inc. a noc. gh

Senior Reviewer: Susan D. Chapnick, New Environmental Horizons, Inc.

Date Completed: November 9, 1999

The Data Usability Review, representing a Region I Tier III-type validation, was performed on the data package. The intentions of this review are: 1) to determine if the data were generated and reported in accordance with SW-846 Methods 8260B, 8270C, 8081A, 8082, the Toxicological Surface Water and Sediment Sampling and Fish Sampling Work Plan and Quality Assurance Project Plan for Industri-Plex Site, Woburn, Massachusetts, July 1999, Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses; Part II. Volatile/Semivolatile Data Validation Functional Guidelines, 12/96 2), and the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA540/R-94/012, February 1994; 2) to determine if the data met the program data quality objectives for acceptable accuracy, precision, and sensitivity; 3) to determine and define the technical usability of the data based on the accuracy, precision, and sensitivity OA/OC indicators; and 4) to update the project database with appropriate data quality qualifiers.

The Data Usability Review consists of five main sections. Section I is the Overall Summary of Data Usability including subsections addressing technical usability, accuracy, precision, and sensitivity of the data. Section II is the Data Package Completeness Review. Section III is the Review of the Laboratory Data Summary Forms and Additional QA/QC Parameters to determine if the QC requirements met and to determine the affect of exceeded QC requirements on the precision, accuracy, and sensitivity of the data. Section IV is the Review of the Overall Data Package to determine if contractual requirements were met. Section V is Example Sample Calculations to determine if the sample results and reporting limits were correctly calculated and reported by the laboratory.

I. Overall Summary of Data Usability

A. Summary of Technical Usability

All benthic invertebrate results for Polynuclear Aromatic Hydrocarbon (PAH) analysis included in the laboratory data package reviewed, identified by Woods Hole Group Environmental Laboratory (WHG) as project number (ETR) 42693 are usable for project objectives. Results have been estimated (J) or negated (U) for several compounds in all of the invertebrate samples due to quality control criteria exceedances. Data users should note the following uncertainties in the estimated results. The estimated and negated results are usable for project objectives.

B. Technical Issues Affecting Accuracy

Holding times, calibration criteria, surrogate recoveries, laboratory control sample recoveries, matrix spike/matrix spike duplicate recoveries, and other method-specific QC sample results were reviewed to evaluate the accuracy of the invertebrate results.

Surrogate recovery in one invertebrate sample was high, outside criteria for two of the four deuterated PAH surrogates added during extraction. The positive results reported for this sample were qualified as estimated (J) and may be biased high.

The Laboratory Control Sample (LCS) recovered all analytes within criteria. However, the laboratory also performed duplicate extraction and analysis of Standard Reference Material (SRM) 1974a, Organics in Mussel Tissue. Results from the duplicate SRMs indicated that naphthalene, phenanthrene, and anthracene were recovered high as compared to the SRM certified reference values. Consequently, all positive results for naphthalene, phenanthrene, and anthracene were qualified as estimated (J) and may be biased high. This action was taken on six of the samples reported.

All other quality control information, such as holding times and surrogate recoveries, associated with accuracy met QAPP and method criteria for the other results in these invertebrate samples.

C. Technical Issues Affecting Precision and Representativeness

The relative percent difference (RPD) between matrix spike and matrix spike duplicate results and between field duplicate pair results were evaluated to assess precision and representativeness of the invertebrate data.

Due to limited sample sizes available for extraction, it was not possible for the laboratory to perform a matrix spike (MS) and matrix spike duplicate (MSD) analysis or a laboratory duplicate analysis. The only duplicate analysis was performed on SRM 1974a. The precision between the duplicate SRMs, as measured by the Relative Percent Difference (RPD) between the recoveries in

the QC samples, were below QAPP criteria of RPD ≤ 50% for all compounds except naphthalene (102% RPD), anthracene (78% RPD), and benzo(a)anthracene (59% RPD). Positive results for naphthalene, anthracene, and benzo(a)anthracene were qualified as estimated (J) due to the poor duplicate precision results observed in the SRM.

No field duplicate was associated with these samples; therefore, precision from the field through analysis could not be assessed.

D. Technical Issues Affecting Sensitivity

Blank contamination in method and field blanks, initial and continuing calibrations, and MDLs were reviewed to assess sensitivity of the results compared to QAPP reporting limits..

The QAPP required reporting limit (RL) for the PAHs was 1 μ g/kg which would have been achieved had 2g of sample been extracted for analysis. Due to the limited sample size available for extraction, the laboratory was not able to achieve the 1 μ g/kg reporting limit expected (sample sizes ranged from 0.2169g to 0.9559g). These reduced sample sizes lead to actual sample-specific reporting limits of between 2 and 9 μ g/kg for the samples in this project. The actual reporting limits obtained are above some of the Human Health Risk Based Criteria (RBCs) for fish tissue; however, they were the best achievable limits for the matrices tested.

The method blank CT0729B2 reported naphthalene at 5 μ g/kg. The Action level associated with this method blank was 25 μ g/kg uncorrected for sample-specific extraction weights. Ten samples associated with this method blank reported results for naphthalene above the reporting limit but below the sample-specific blank action level. In these samples, the result for naphthalene was negated (U) and the level set at the concentration originally reported for the samples. Sample SD-3 O was the only sample which reported naphthalene that was not negated due to blank action. The negated results meet the Ecological and Human Health RBCs and are usable.

The method blank CT0729B2 reported 2-methylnaphthalene at 3 μ g/kg. The Action level associated with this method blank was 15 μ g/kg uncorrected for sample-specific extraction weights. Ten samples associated with this method blank reported results for 2-methylnaphthalene above the reporting limit but below the sample-specific blank action level. In these samples, the result for 2-methylnaphthalene was negated (U) and the level set at the concentration originally reported for the samples. The negated results meet the Ecological and Human Health RBCs and are usable.

The method blank CT0729B2 reported phenanthrene at 4 μ g/kg. The Action level associated with this method blank was 20 μ g/kg uncorrected for sample-specific extraction weights. Seven samples associated with this method blank reported results for phenanthrene above the reporting limit but below the sample-specific blank action level. In these samples, the result for phenanthrene was negated (U) and the level set at the concentration originally reported for the samples. The negated results meet the Ecological and Human Health RBCs and are usable. Samples SD-9 A&C, SD-11 C

and SD-13 A&C reported results for phenanthrene which were above the sample-specific blank action level and were therefore reported as detected values.

E. Additional Technical and QA/QC Issues

A review of method compliance, an evaluation of method modifications, and other QA/QC issues were made to evaluate the comparability of the data generated for the project uses.

The laboratory followed the procedures outlined in their SOP Analysis of Parent and Alkylated Polynuclear Aromatic Hydrocarbons and Selected Heterocyclic Compounds by Gas Chromatography/Mass Spectrometry with Selected Ion Monitoring (Revision 1). The SRM data were evaluated by the lab after recovery correction was made to the results (adjusted based on the recovery of closely eluting deuterated surrogate compounds). This procedure is an option within the laboratory's SOP for certain reporting requirements; however, for the work on this project, this recovery correction was not appropriate. The sample data was checked and it was verified that recovery correction was not made when sample results were reported. Therefore, during assessment, the SRM data was recalculated without recovery correction and actions taken based on this assessment as outlined in Sections B and C.

F. Summary of Completeness, Documentation, and Chain-of-Custody Issues

All samples were received at the laboratory on July 2, 1999 with proper preservation (temperatures upon receipt were 4°± 2°C) and chain-of-custody documentation. Upon receipt, the invertebrates were immediately frozen until compositing and extraction could be performed on July 29, 1999.

Amphipods, Chironomids, and Odonats were obtained during the sampling process. For each station, the laboratory composited the Amphipods and Chironomids into a single sample (called A&C), as directed by Menzie Cura & Associates, prior to analysis. After compositing, samples SD-3 A&C and SD-10 A&C did not have sufficient biomass to allow analysis. Therefore, these samples were not analyzed for PAHs. Additionally, based on the chain-of-custody for benthic invertebrate sample collection, no benthic invertebrate samples were collected at stations SD-05 or SD-12.

The laboratory reported results for several analytes that were also detected in the method blank. The laboratory qualified these results with a "B" to indicate this fact. During assessment, these results were either negated (U) or accepted as discussed in Section D. The "B" qualifier was not associated with the final data usability qualification of results.

Industri-Plex, Woburn, MA Organic Data Usability Review

NEH generated a data summary table based on the project data file supplied by the laboratory including the corrections and qualifications added to the data based on this Data Usability Review. The data summary table of technically valid and usable results for the invertebrates reviewed by NEH is attached to this report.

Industri-Plex, Woburn, MA Site and Reference Location - Organic Benthic Invertebrate Data

Office Committee 10:																		
Client Sample ID:				SD-02 A&C			SD-02 O			SD-03 O			SD-04 A&C			SD-06 C		
Lab Sample ID:				42693-2			42693-3			42693-5			42693-6	-		42693-7		
	Tissue			Tissue			Tissue			Tissue			Tissue	1	_	Tissue		-1
Sample Date:		Lab	DV	07/02/99	Lab	DΣ	07/02/99	Lab	DV	07/02/99	Lab	DV	07/02/99	Lab	DV	07/02/99	Lab	DV
Units	µg/Kg wet	Qual.	Qual.	μg/Kg wet	Qual.	Qual.	µg/Kg wet	Qual.	Qual.	µg/Kg wet	Qual.		μg/Kg wet				Qual,	Qual.
ilyte - PAH										· · · · · · · · · · · · · · · · · · ·	•					P3-1-13-11-0-	4,000,	Groen.
\ Method 8270C-SIM										-		1			_			
hthalene	17	В	U	27	В	U	18	В	IJ	89	В	J	15	В	ü	16	B	u
ethylnaphthalene	5	В	U	10	В	U	7	В	U	32		U		В	u u		U	U
naphthylene	3	U	U	8	U	u	4	u	U	13			2				Ū	U U
naphthene	3	U	U	8	U	U	4	U	U	6	J	u		U	u		U	U U
prene	3	U	U	8	U	U	4	U	U	7				Ū	lu		Ū	Ü
nanthrene	9	В	U	23	В	U	4	U	U	45	В	u	11	-	Ū	42		U
hracene	3	Ų	U	8	U	u	4	U	U	8		J		U	U	9	 	J.
pranthene	8			13		,	4			28		<u>-</u>	12		<u> </u>	65		- -
ene	8			9			4	U	U	21			10	——		48		
izo[a]anthracene	4		J	8	U	U _	4	U	U	15		J	4		J	22	-	,
ysene	5			8	U	U	4	U	U	12			6		 	25		
120[b]fluoranthene	3	U	U	8	U	U	4	U	IJ	8			4			27		
120[k]fluoranthene	3	U	U	8	U	U	4	U	U	7	•		2	บ	υ	8		
ızo(a)pyrene	3	U	υ	8	U	٥	4	U	U	8			2			15		
eno[1,2,3-cd]pyrene	3	U	υ	8	U	Ü	4	U	U	8			3		 	15		
enz[a,h]anthracene	3	٦	U	8	U	Ų	4	U	U	6	J	Ū	2	U	u		U	U
ızo(g,h,i]perylene	3	J	υ	8	U	U	4	U	U	8			3			14		
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<u>ıy:</u>					_													\vdash
Amphipods								-								-		
Chironomids										· -					†		-	\vdash
Odonats												 						
C = composite sample						,							 .	-	 			
imphipods plus						<u> </u>						 	· · ·					\vdash
onomids														 	-			
					·								<u> </u>	<u> </u>	L			

SITE_REF_C, s_benthic.xls
Page 2 of 2

Industri-Plex, Woourn, MA Site and Reference Location - Organic Benthic Invertebrate Data

Validated 12/06/99 NEH, Inc.

										_					
Client Sample ID:	SD-07 A&C			SD-08 A&C			SD-09 A&C			SD-11 C			SD-13 A&C		
Lab Sample ID:	42693-8			42693-9			42693-10			42693-12			42693-13		
	Tissue			Tissue			Tissue			Tissue			Tissue		
Sample Date:	07/02/99	Lab	DV	07/02/99	Lab	DV	07/02/99	Lab	DV	07/02/99	Lab	DV	07/02/99	Lab	DV
Units	µg/Kg wet	Qual.	Qual.	μg/Kg wet	Qual.	Qual.	µg/Kg wet	Qual.	Qual.	μg/Kg wet	Qual.	Qual.	μg/Kg wet	Qual.	Qual.
Analyte - PAH															
EPA Method 8270C-SIM															
Naphthalene	8	В	IJ	8	В	U	16	В	U	42	В	U	29	В	U
2-Methylnaphthalene	4	В	U	4	В	U	11	В	U	19	В	Ū	10	В	U
Acenaphthylene	2	u	Ų	3			3	U	U	9	U	U	6	U	U
Acenaphthene	3			3	Ų	Ų	3	U	U	28			22		
Fluorene	3			3	U	υ	4		J	29			11	·	
Phenanthrene	12	В	U	14	В	Ų	28	В	J	180	В	J	80	8	J
Anthracene	2	U	U	3		J	3		J	23		J	13		J
Fluoranthene	14			22			44		J	450			90		
Pyrene	10			17			35		J	310			84		
Benzo[a]anthracene	3		j	7		J	9		J	59		J	28		J
Chrysene	4			12			12		J	130			39		
Benzo[b]fluoranthene	2			7			8		J	73			26		
Benzo[k]fluoranthene	2	U	U	4			4		J	19		-	7		
Benzo(a)pyrene	2	u ·	υ	7			6		J	25	-		19		
Indeno[1,2,3-cd]pyrene	. 2	U	υ	6			6		J	34			16		
Dibenz[a,h]anthracene	2	U	U	3	د	U	3	U	U	9	U	U	6	U	U
Benzo(g,h,i)perylene	2	U	υ	6			5		J	34			17		
Key:															
A = Amphipods											_				
C = Chironomids		ļ													
O = Odonats															
A&C = composite sample															
of amphipods plus															
chironomids			: 												

8270C

			Data R	Review Checklist				
ab: INHGSI			For	Region 1 Til	erII-tuae	Lab Project#:	ETR 420	93
Date Sampled: 712199						No. Samples	11	
Method of Analysis: 8270C				. Validation	า	Matrix:	Sediment / \	Water (Biota)
			DUM	imary		·		
	HT			O	FD		RL	
	w (7d)				W:RPD≤30%	Accept.	& Quant.	%Solids
	other(14d)	Surrogate	LCS	MS	Other:RPD≤50	% Blanks	Correct	(>30%)
All Samples in Project		1	LESOK	NIA	NIA	See pro		NIA
Except:			Sem Action:					
50-9 A+C		J positive detects	Sec 197.4	ini.				
								:
· · · · · · · · · · · · · · · · · · ·								
Lab used their So	P - Amalysis	of Prevent	and Alkyla	ted PAtts a	nd Selected	Heterocyclic	Consula	by Galms with
comments: SIM to vep	at PAH d	<u></u>					<u> </u>	<u> </u>
13 Sets of Sung	he sent to	lub. Per	Monzie C	wa , Ampt	ipods and C	thirmdmid	ls Congosi	tred Coulied A
After compositing	Saple SD-	3 (A+c)	and 50-1	0 (A+C)c	lid not have	sufficient	biomin	for analysis
Cie. weight 22 la	1 => Kesult	5 dr who	11 Sag	in reported	•			<u> </u>
Single were rece	cived at 6°	c and hi	amediately	trozen u	ntil extructi	my 7/29/90	i-Allama	निरंग श्रीन-ह्याट
						<u></u>		
					·····	<u> </u>		

Data Review... 7 - C.R.M.

Lab: WH (751	, ,	Data Re	8270C eview klist	Lab Project #:	ETR 42693
Date Sampled: 7/2/99				No. Samples	((
Method of Analysis: 8270C Associated Blanks:	CT072982 (SBLEO))		Matrix:	Sediment / Water (Biota)
Blank ID	Contaminant / Level	Matrix Related?	Action Level		Corrected Result
		/ Laisten	303		N
CT072982	Naphthalma 549/Kg		LAVARIA TO	Sample SD-1 A+C, SD-	20, Nayhthalene
			Cinest !	5D-4 A+C, 5D-6C, 51	7-7 A+C, regated (U) at
					results level Reputat
				>RL but 625mlkg	,
				Single SD-ZAVC 50-11	1C+ DNaphthales
				*	olky but (negated (u) at
					1 12 /
			<u> </u>	using actual Surgle we	ight level
8270C Action Summary:				extention these result u	
HT Actions: Water	ers 7d <ht≤ 14="" d;="" det="" i<="" j="" nds;="" td=""><td>HT >14 d. J d</td><td>et/R ND</td><td>> RL but & Suph-spice</td><td>in the property of the propert</td></ht≤>	HT >14 d. J d	et/R ND	> RL but & Suph-spice	in the property of the propert
Sedimer					Black Adims continued a
-	ota Stored up to 1 year frozen; 14	· ·			Black Adims continued a page 3
Analy Surrogate Actions:	rsis 40d < Extract HT ≤ 60d, J dei 2 BN or 2 Acids Recovery > Crite				•
	Recovery < 10%, J det/R NDs. A				
Blank Actions:	Surrogates outside criteria - Use				
	Non-Matrix related Blank contain Matrix related Blank contamination				
MS Actions:	week seems blank Wildilligh	ин. т трэц іі 🕆 Г	w. V (₩ƏUII GLI ME, MI	es resultablent Modell, O 1630	ir ar ievei i ebolien
	%Rec<10%, J det/ R NDs; 105	% ≤%Rec <cr< td=""><td>iteria, J det/ J NDs; ˈ</td><td>%Rec >Criteria, J det/Accept N</td><td>NDs for Unspiked Sample only</td></cr<>	iteria, J det/ J NDs; ˈ	%Rec >Criteria, J det/Accept N	NDs for Unspiked Sample only
LCS Actions:	%Re<<10% det/ R NDe: 10°	4 <%₽e<<0ri>d	teria I det/ 1 NDe: 9	%Pac >Critoria 1 dot/Accont N	IDs for all Batch by Compound
FD Action:				≥2 x RL, J det/J NDs; Both Con	c. < 2xRL; %RPD out, LCS OK,
%Solids Action:	10% ≤ % soilds ≤ 30%; J det/R f	ND; %solids <	•		
Date 11/9/99					
Data Reviewer 77	c.gh_		2 of 5		lew Environmental Horizons, Inc.

8270C Data Review Checklist

Lab:	WHUEL	
Date	Sampled: 7/2/99	

Method of Analysis: 8270C

Lab	Project	ë
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ETR 42693

No. Samples

15

Matrix:

Sediment / Water (Biota)

Blank Action Continued

	. — - роз				
Blank ID	Contaminant / Level	Matrix Related?	Action Level / Action		Corrected Result
CT0729B2	2-methylnuphthalas	7	1545/14	SD-1 AQC, SD-2 A+C	
	at 3mg/kg		(Buard on)	50-4 A+C, 50-7 Ac	C. Thulas verit
			(१ (धर्मकर्म)	5D-8 A-C 5D-9 A+	C and Unevated (u) at
			3	50-13 A+C reported 7	i-methyl Level Reportion
· · · · · · · · · · · · · · · · · · ·				SD-13 A+C reported to	< 1547/K
			ž (<u> </u>	·)
			* S	Sungler SD-30 and SI	D-11C DZ-methylnaph-
			(1)	reality >15mg/mg but	using (thatere result
			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	actual Sungla site of the results were Oxide	: extrato, 2 negated (4)
		-		The vestile were 0>121	- but cut level
		 		L Sample-Specific Act	in level I Reported
CT0729BZ	Phenunthrene at 4 ms/x4	-	20mg/km	57 10 5 57 511 0	81
C10-76-182	THE CANTINIENCE DA STOFF			5D-1A-C, 5D-4 A+C 5D-7A+C, 5D-8 A	C. Pherusthrene
			(lig ext)	results > RL but 620	rac (neward u) at
				JESOND / KE BIOM E ZU	ASIN THE ENGINE
				SD-2 A+C , SD-30 15	D-GC Pheny three
					sample - I negated (u) at
				spicific A.L	Level Reporto
				Sugar 50-9 A+C.5	D-11C 7NO Action
				and 50-13 A+C Ph	enanthem
				results > Samph sp Black Action Wheel	aite /
			<u> </u>	Black Action Wheel	
		1			
					
			[
		<u> </u>	* <u> </u>	(2) (2) (2) (3) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	
		 			
		1			
Date ule\aa					

Date <u>11/8/94</u>

Data Review.

(Data Review (Klist		(
Lab: <u>W H (75.L</u> Date Sampled: <u>712.44</u>	_	Lab Project#: No. Samples	ETR 42693
Method of Analysis: 8270C	•	Matrix:	Sediment / Water / Biota
Additional Notes:			
For Black Action, the	cactual Sough weights extented were used to	judge wheth	a action was required.
the payle for Nuch	that in Sorgh SD-13 A+C, The weight	extacted we	1. 0.3568 y carford
Dedict of the at I a	Therefore the scape-specific Black Action		
- 50-04 5D-30 re		the luch rep	
		TO WELL	Daphhulenun
	No Action was taken for this I say		
100 10 10 100 300	gh data was eliminated in the DVO	qualifier de	<u> </u>
- Fly Scholer SD-9A+1	C, SD-11 C + SD-13 A+C, The Phenanthren	- resutts res	enty were above the
Suph specific Blak	Action well so no action taken During	Assemnt	T- "R" qualifier
added to the smoh	results was eliminated in the DV qualif	iws.	
Surrogutor for all some	La except SD-9 A+C Acceptable. Fix 5-9	ATC Phences	threat-dip 133% Rec
(35-12595 criteria)	and Chrysm-diz 13290ki (40-1305 cm	terren) => 2	ont of 4 Surroyati
received high above	criteria All positively detected results	In Sman 5	0-9 Age were qualitied
as estimated (T) d	me to high surregate recovery - results	may be bio	roal high.
100 07077017 10.	1 10 Days = 72 - 72		
LCS CTO 729LZ - Pic.	way of all PAHB + Surrogate 73-9890 -	No Action	Required.
5 Rm 1974 (mussel	tissue) also extracted + analyzed in duplica	TJ (CT072	951 + CT072952).
In evaluation SRM 1974	la lab recover corrected results based a	n surrount	recounts homever.
this should not have	ben dre with this data set (ie. sugh	result wer	e not recover corrected)
Duplicate SRM data			thrace and Rongola) Na
unthragen compared	to Certified Values => I results for the an		mels man be biased
high. Action: Positive	a results for naphthalis, phinasthrone, as	othracene por	proviously in equitor
have been qualified as	estimated (J) - affects singly: 503-0, 50-	HALL SD-4	A+C, 50-6C, 50-7 A-C,
11.	T SD-13 A+C SD-9 A+C. (HOWAVEAUE: LIVE	ral detected	na othalous secults
Date <u>Hishi</u>	blank actions; there fore high bias	* estima	tion not longer De
	upplicable) these in	clused for	tapthalow SB- 12/6/
Data Reviewer 1 C. R	4 of 5		New Environmental Horizons, Inc.

8270C Data Review Checklist

Lab: WH(TEL	Lab Project #:	ETR 42693
Date Sampled: 7 2 99	No. Samples	11
Method of Analysis: 8270C	Matrix	Sediment / Water / Biota
Additional Notes:		
No my performed with Batch (not enough so	- 5RM 1974a done ins	tead.
No Field Duplicate or Lab Duplicate with 5	· · · · · · · · · · · · · · · · · · ·	
PL- Ladest ICAC standard at 10 ng/mc - volume the RC = 10 x 0.2 = 2 mg		
volume The R1 = 10 x 0.2 = 2 mg	1/49	<u> </u>
	En la Mart Ada th	Cun 11 lacens
- Sample-specific RLs property reported	. 3 aspec weights between	Tanga girin
0.2169 g to 0.9559 g => Reporting	limits were raised from a	APP RLA I MOIK
due to limited Samph size for Ext	action. These Ris for the	PAHs in three sapers
are higher than some of the Huma	-hall RRCs 1- Fish	Tissin ; however,
given the matrices, the were the	- best achievable limite	de vepating.
		+
The RPD between the CTOTESSI and CTOTES	SZ PECWENIS WERE 6 SDS 1	all analytis except
Nonothalm (10290 RPD). Anthracen (74.490 R	PD) and Benzo (w) centhiale	- (5990 RPD). Based
on the imprecision, the results for Naph	thate, Anthonene and Ben	zo la anthracme were
qualified as estimated (J).		
Date		
Data Review. 7 - C.R.L.	5 of 5 (New Environmental Horizons,

V. DUC for Nov., Inc. 11/8/99

Industri-Plex, Wooum, MA
Organic Benthic Invertebrate Data

Draft 11/8/9/

				 						50-63 50-6-1						50 °C 0			
Client Sample ID:				SD-2 A&C			SD-2 O			SD-3 O			SD-4 A&C			SD-6 C			
Lab Sample ID:				42693-2			42693-3			42693-5			42693-6			42693-7			
Matrix:		<u> </u>		Tissue		<u> </u>	Tissue			Tissue		L	Tissue			Tissue			
Sample Date:		Lab	DV	07/02/99	Lab	DV	07/02/99	Lab	DV	07/02/99	Lab	DV	07/02/99	Lab	DV	07/02/99	Lab	DV	
Units	μg/Kg wet	Qual.	Qual.	μg/Kg wet	Qual.	Qual.	μg/Kg wet	Qual.	Qual.	μg/Kg wet	Qual.	Qual.	µg/Kg wet	Quel.	Qual.	μg/Kg wet	Qual.	Qual.	
Analyte																			
8270C-SIM							<u> </u>												
Naphthalene	17	В	U	27	В	U	18	В	U	88	8	J	15	В	U	16	В	U	
2-Methylnaphthalene	6	В	U	10	В	U	7	В	υ	32	8	U	6	В	U	7	U	U	
Acenaphthylene	3	U	U	8	U	U		U	U	13			2			7	U	U	
Acenaphthene	3	U	U	8	دا	U	4	U	U	e	U	U	2	U	U	7	U	U	
Fluorene	3	U	U	8	د	U	4	U	Ü	7			2	υ	U_	7	U	U	
Phenanthrene	9	В	U	23	В	U	4	U	υ	45	В	U	11	8	U	42	В	U	
Anthracene	3	U	U	8	5	U	4	U	داد	8		J	2	U	U	9		li li	
Fluoranthene	8			13			4			28			12			65			
Pyrene	8	L		9		İ	4	U	Ų	21			10			48			
Benzo(a)anthracene	4		J	8	J	U	4	U	Ü	15		J	4		J	22		J	
Chrysene	5			8	د	U		บ	υ	12	!		6			25			
Benzo[b]fluoranthene	3	U	U	8	٦	U	4	U	د	8			4			27			
Benzo[k]fluoranthene	3	U	U	8	U	U	4	υ	υ	7			2	U	U	8			
Велго[а]ругеле	3	U	U	8	Ü	U		U .	٥	8		<u> </u>	2			15			
indeno[1,2,3-cd]pyrene	3	U	U	8	U	U	4	U	Ü				3			15			
Dibenz[a,h]anthracene	3	U	U	В	J	u	4	U	U	6	U	U	2	U	u	7	U	U	
Benzo[g,h,i]perylene	3	U	U	8	U	U	4	U	U	8			3			14			

Add Ker

Industri-Plex, Woburn, MA Organic Benthic Invertebrate Data

50-07					3D-08		0.9.	ラ Φτγη	5P-11			5D-13				
Client Samp	le ID:	SD-7 A&C			SD-8 A&C			SD-9 A&C			SD-11 C		Ţ	SD-13 A&C		
Lab Samp	le ID:	42693-8			42693-9		1	42693-10	-		42693-12	··		42693-13		
	latrix:	Tissue			Tissue			Tissue			Tissue			Tissue		
Sample	Date:	07/02/99	Lab	DV	07/02/99	Lab	DV	07/02/99	Lab	DV	07/02/99	Lab	DV	07/02/99	Lab	DV
	Units	μg/Kg wet	Qual.	Qual.	μg/Kg wet	Qual.	Qual.	μg/Kg wet	Qual.	Qual.	μg/Kg wet	Qual.	Qual.	µg/Kg wet	Qual.	Qual.
Analyte																,
8270C-SIM																
Naphthalene		- 8	В	U	8	В	U	16	В	U	42	В	Ų	29	В	U
2-Methylnaphthalene		4	В	U	4	В	U	11	В	U	19	В	U	10		U
Acenaphthylene		2	υ	U	3			3	U	U	9	U	υ		U	U
Acenaphthene		3			3	U	U	3	U	U	28			22		<u> </u>
Fluorene		3			3	U	U	4		J	29			11		
Phenanthrene		12	В	U	14	В	u	28	8	J	180	В	J	80	В	J
Anthracene		2	U	U	3		J	3		J	23		j	13		J
Fluoranthene		14			22			44		J	450			90		
Pyrene		10		L	17			35		J	310	-		84		
Benzo[a]anthracene		3		J	7		J	9		J	59		J	28		J
Chrysene		4			12			12		J	130			39		
Benzo(b)fluoranthene		2			7			8		J_	73			26		
Benzo[k]fluoranthene		2	Ų	U	4			4		J	19			7		
Benzo(a)pyrene		2	U	U	7			6		J	25		Ī	19		
Indeno[1,2,3-cd]pyrene		2	U	U	6		L	6		J	34			16		
Dibenz(a,h)anthracene		2	U	U	3	U	U	3	U	U	9	Ų	U	6	U	U
Benzo[g,h,i]perylene		2	U	U	6			5		J	34			17		

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